

**HOW TO USE
PSYCHOLOGY IN BUSINESS**

*This book is produced in full compliance
with the government's regulations for con-
serving paper and other essential materials.*

OTHER BOOKS

BY DONALD A. LAIRD

- More Zest for Life* McGraw-Hill Book Company, Inc.
What Makes People Buy McGraw-Hill Book Company, Inc.
How to Use Psychology in Business McGraw-Hill Book Company, Inc.
Increasing Personal Efficiency .. Harper & Brothers
Psychology and Profits B. C. Forbes Publishing Company
How to Make People Like You .. Blue Ribbon
How to Rest and Sleep Better ... Funk & Wagnalls Co.
-
- Modern Försäljningsteknik* Bokförlaget Natur och Kultur,
Stockholm
- Hur Man ökar sin Arbetsförmåga* Bokförlaget Natur och Kultur,
Stockholm
- Sömnen: Varför vi behöva den och hur vi få den* Stockholm
- Wie Steigere Ich Meine Leistungsfähigkeit* Josef Singer, Berlin

HOW TO USE PSYCHOLOGY IN BUSINESS

BY

DONALD A. LAIRD, PH.D., SCI.D.
Rivercrest Laboratory, Hamilton, N.Y.

FIRST EDITION
NINTH IMPRESSION

McGRAW-HILL BOOK COMPANY, INC.
NEW YORK AND LONDON
1936

COPYRIGHT, 1936, BY

DONALD A. LAIRD

PRINTED IN THE UNITED STATES OF AMERICA

*All rights reserved. This book, or
parts thereof, may not be reproduced
in any form without permission of
the publishers.*

To the memory of

MELBOURNE STUART READ

Professor of Psychology at Colgate University, 1895–1927

Calm scholar who fostered the
art of learning with an abhorrence
of bloated trivialities

PREFACE

Friendly conversations with many average businessmen, and with executives of small plants, have given me the burning impression that they are *afraid of psychology*. They have been frightened away because most of them have not yet run across a book written in their own language, dealing with the problems they are up against daily. Many of them, it is true, have bought a book or two on some phase of industrial psychology, only to discover on trying to read it that it has been written for graduate students or specialists in the field, and is as clear to them as the expression on the changeless face of a poker player.

I have written this book with the rumble of a small plant in my head, trying to keep in the foreground on every page the tempo, the language, the interests, and the problems of the average businessman. I have not made the least effort to write a book for professional psychologists, or for the embryonic psychologists who are trying so hard to get the feel of the micrometer and the swing of the hammer in graduate school.

"So this is your book," let me say to the average businessman. "It was written especially to be useful to you, and to no one else. In it I try to give you more than mere information. There is a deeper understanding of your perplexing problems which psychology can give you, and which I have tried to weave into the book."

"Then, too, the bearing of psychology on the matter of government and the future of the nation has been touched upon; you businessmen have to pay the bill and, I feel, should know the frank facts which are usually skirted around. If the book seems to ramble in spots, it rambles for a purpose—as your salesmen often do."

If the average executive does not read this book, and does not profit from it, then I must admit that I have failed. Material of interest to the salesman and the sales executive is scattered throughout the book; it has seemed wise not to have a special section on this phase, in view of the recent publication of my book, "What Makes People Buy," which has had a wide circulation in the sales world.

That the material in this book has practical usefulness, as well as scientific backing, is reflected by the business periodicals which have published some sections of the book before its appearance under board covers. I am indebted to the following for their courtesy in allowing me to include in the book material which I first reported in their publications: The *American Weekly*, *Every Week Magazine*, *Factory Management and Maintenance*, the Ford Motor Company, E. F. Houghton & Company's *Black & White*, the American Medical Association's *Hygeia*, the *Journal of the American Dietetic Association*, the *Office Economist* of the Art Metal Construction Company, the *Public Ledger Magazine*, the *Medical Record*, the *Medical Review of Reviews*, the *New Republic*, *Physical Culture*, *Popular Science Monthly*, the *Review of Reviews*, *Science*, the *Scientific American*, Science Service's *News-Letter*, Street & Smith's *Progress*.

In addition I am under obligation to Alan Macdonald for literary assistance in some sections of the book. The illustrations which are not original are credited, where they occur in the book. I am indebted to David Drexel Laird for assistance in all phases of making the photographs to illustrate the book.

DONALD A. LAIRD.

RIVERCREST LABORATORY,
April, 1936.

CONTENTS

	PAGE
PREFACE.	vii
I. HOW PSYCHOLOGY HAS GONE TO WORK	1
II. WHAT PSYCHOLOGY DOES IN BUSINESS.	16
III. HOW PEOPLE DIFFER IN BUSINESS	27
IV. HOW AND WHY PEOPLE ARE DIFFERENT IN GENERAL ABILITY	38
V. HOW MUCH BRAINS FOR THE JOB?	57
VI. HOW INTERESTS CAN HELP BRAINS	78
VII. LAZY PEOPLE AND INTERESTS.	93
VIII. ABILITY TO GET ALONG WITH PEOPLE	108
IX. PEOPLE HARD TO GET ALONG WITH	129
X. THE BOSSY AND THE INTERFERING.	147
XI. SOME MORE WHO ARE HARD TO GET ALONG WITH	164
XII. CAN THE ORDINARY PERSON'S JUDGMENT BE TRUSTED?	180
XIII. HOW TO TELL WHEN SOMEONE IS LYING.	197
XIV. SOME WAYS TO READ CHARACTER.	208
XV. HELPS IN READING FACES AND THOUGHTS	218
XVI. TAPPING THE SOURCES OF HUMAN ENERGY.	236
XVII. EATING FOR WORK AND FATIGUE	251
XVIII. THE MOST EFFECTIVE METHODS OF USING HUMAN STRENGTH	277
✓ XIX. IMPROVING THE CONTROL OF MUSCLES.	292
XX. WEATHER FOR WORK AND SELLING	308
XXI. DRESSING FOR EFFICIENT WORK	319
✓ XXII. CONTROLLING THE NOISES OF BUSINESS	328
XXIII. THOSE WHO CAN LEAD IN BUSINESS.	358
INDEX.	373

HOW TO USE PSYCHOLOGY IN BUSINESS

CHAPTER 1

HOW PSYCHOLOGY HAS GONE TO WORK

To the reader: This first chapter is necessary, but you may find it dull reading. If so, after trying a few pages, jump ahead to the second chapter.

Psychology has gone to work. You will not see it in the line of men hurrying through factory gates just before eight in the morning; but it has gone to work with them, nevertheless.

It does not have a white-collar job. It is in overalls and carries a thermos lunch kit. You will find it at work in the dirtiest parts of the factory, smeared with grease, and in the pits of coal mines with its face as smudgy as any. On the seat with your taxi driver you will find it, beside the hand of the motorman on the trolley car, helping the foreman break in a new worker whose fingers are not yet deft at the strange work, and in the salesman's kit.

In a restaurant psychology went to work. After the psychologists had completed their work, the manager wrote: "In spite of the fact that we had gone to a great deal of trouble in the planning of our restaurants to eliminate factors likely to interrupt smooth working, you have shown innumerable places where we failed in detail, and those details are undoubtedly the cause of waste of labor, of irritation, and of breakages. To have reduced our breakages by 44 per cent as a result of one month's work is a considerable achievement."

So when powerful Katrinka smashes unheard-of quantities of your dishes in the kitchen, try putting psychology to work with her!

Girls employed as candy packers, and paid by the piece rate, had their output increased 35 per cent after psychologists had made a study of the best methods of doing their work.

Taxicab accidents were reduced one-third by a large company which employed about 6,000 drivers, through the work of a psychologist who was on their staff for several years.

Output of girls wrapping tobacco was increased 14 per cent when monotony and fatigue were lessened by having the girls shift operations twice in each working spell. On a laundry mangle, output was increased 30 per cent when psychologists, after study, had the feeder and the receiver shift places every twelve minutes so that the one avoided excessive fatigue from continuous standing.

An 11 per cent gain in output on a clamping machine in a box-making factory followed when psychologists altered the foot lever to prevent uncomfortable leg stretching, a heavy spring was installed to help the work of the lever, a support shortened to give more space for unfinished work, and the tools rearranged to save lifting a heavy weight hundreds of times a day.

Fatigue in filing metal bars was decreased by adjusting the height of the work bench to make it 60 per cent of the height of the worker.

When psychologists changed the glass globe of the miner's lamp, distracting after-images were reduced by half, and the vein of coal better lighted. Many thousands of the improved lamps are now in use, preventing much fatigue underground.

How in the name of reason can psychology accomplish these things?

The average business person must think he uses psychology. At least, the way he uses the word to explain things when all other words fail him would lead to that conclusion. When he explains the loss of a sale, he is likely to shrug his shoulders knowingly and say, "The psychology wasn't just right." Probably something was wrong, whether it was psychology or something else.

But knocking the idea of psychology around in this way has not done any great damage. Usually such an explanation is followed by a deep silence and the feeling on all sides that the fellow is simply at a loss.

In contrast with this dragging in of a mysterious term to explain all when the average executive is up against a wall, is the cold, experimenting, matter-of-fact approach of the qualified psychologist, who has not just conjured up a word, uttered it solemnly, and let the matter drop as though it were all explained and understood. When up against the unexplainable in business, the psychologists, these last twenty years, have buckled down to hard work and fact-finding to search out just what the hitherto unexplainable amounted to and how it can be put to work.

For psychology has gone to work. You may not see it punch the time clock or hurry through the factory gates with its lunch kit in hand just before seven in the morning; but it has gone to work. It may not even be on the payroll; but the odds are that the firm tries to make some use of psychology, and there is a slight possibility that they do make some sensible and deliberate use of modern psychological knowledge.

In a few instances, perhaps one firm out of a thousand, they have at some time or another employed a psychologist to help them out. And there are some firms that have had a well-qualified psychologist working all his or her time for them steadily week after week for the better part of the last fifteen years.

Twenty years ago there was not much that psychology could do for a firm, except to look wise and make shrewd

guesses. Today psychology is in a far different status. The two intervening decades have been silent witnesses of feverish activity in many college laboratories, factory shops, offices, advertising agencies, and even in institutions for the feeble-minded; they have uncovered precious new information of tremendous value at times in the humdrum business of making profits and in the supreme business of saving workers from excessive fatigue and from gnawing boredom and failure. It has taken highly ingenious psychologists, especially apt at scientific research—and considerable salesmanship to get industries to try out this and that—to advance the knowledge of how psychology can be put to use to help the lot of the rank and file as well as to serve the pocketbooks of the stockholders.

These psychologists of the past decades have almost literally worked themselves out of a job. Not entirely, however, because, in this country, probably they have given more attention to trolley-car motormen than to workers in any other single occupation, and just at a time when the motormen appear to be taking their place in the same retirement as canal-boat captains! It is this way: the psychologists have produced enough new information so that almost anyone with a level head and good intentions can draw from this storehouse of discoveries and make some helpful use of them in improving his own business or in helping the progress of his own life. Unfortunately, however, not all this newer industrial psychology is foolproof, and serious mistakes are often made by the person who, with inadequate training or insufficient reading in the field, becomes oversold and rushes ahead to make an application which is not entirely appropriate.

This is true, of course, for all fields in our highly specialized modern world. Today almost any high-school boy can connect a push button with an electric bell; but it is still wise to have a master electrician look over the

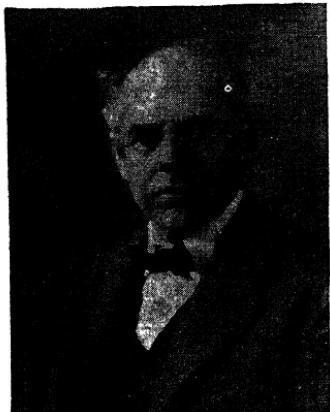
wiring to make certain that it has not been connected with a high-voltage line which would knock the salesman off the front porch when he pushed the button. We all know a little business law, but an attorney is a valuable person to have look through the contracts we have drawn up before signatures are affixed to them. We can all use an adding machine, but it usually takes an auditor to discover the real condition of our business. We can find out that the carburetor of our car is out of adjustment, but it takes a greasy and apparently unconcerned mechanic to adjust it for the proper mixture of gas and air.

If these analogies are not kept in mind, popular accounts of industrial psychology may be a little dangerous. The intensely practical reports of the findings of many industrial and laboratory psychologists, from many countries, may prompt the energetic reader to decide impulsively to put into effect tomorrow what he reads tonight. Don't! Think over the entire situation first. There may be some conditions with your firm, or in your case, which would complicate the smooth working of the plan, perhaps make it disastrous. Then, too, find out more about the matter by reading intensively. Do not rush ahead. Get thoroughly in hand all facts bearing on the question, then carefully adapt the procedure to your needs, try it out on a small scale, and watch results.

Whenever the application you contemplate involves a number of persons, or much expense, or a period of time to watch for results, the wise thing to do is to get in touch with a person near at hand who is qualified by training and experience to get you the technical help which you will likely need, in spite of the apparent simplicity with which the results presented in reports seem to have been accomplished.

Although distance lends enhancement, you will probably find at a college or university close by someone who is qualified to help you. I suggest that you write to the departments of psychology of two or three colleges, asking

each of them to put you in touch with some member of the staff who is the logical man for the problem you have in mind. If you can get someone to give you expert technical help on your man-power problems for less than a per diem of fifty dollars, or its equivalent over a period of time, you could better save your time by using an almanac instead. As an evidence of good faith on my part, let me ask you not to get in touch with me.



J. McKeen Cattell, first to devise mental tests, first to start a laboratory for teaching psychology to college students, and founder of this continent's Psychological Corporation.

The Psychological Corporation, 522 Fifth Avenue, New York City, is an American clearing-house of practical and duly qualified psychologists with which it is worth while to communicate for assistance. In England there is the unique and eminently successful National Institute for Industrial Psychology, Aldwych House, London, which puts to shame anything of the kind in America—or anywhere else in the world—and which is a virile, living monument to Dr. Charles S. Myers, in a country where psychology otherwise is pretty far back in the days of used-to-be.

I know that people will still place a bet on a spavined race horse, buy submerged building lots, and believe in the good intentions of the strange girls who make a fuss over them in the blue smoke of a night club, but I still like to hope there is a glimmer of good sense shown by the human race at times. So I trust I am not wasting the paper and ink of the publisher when I warn you about trying to get anything more than high-grade salesmanship and a rooking

if you go with your man-power problems to a crystal gazer, fortune teller, astrologist, horoscope reader, hypnotist, character reader, radio psychologist, radio "doctor" or "professor," or any of these dynamic middle-aged women who give a week of lectures (personal conferences extra) on secret powers and the control of others, or the question-and-answer pages of the newsstand magazines.

This may strike some readers as being unnecessary advice and may incense others as being unfair.

It is certainly necessary advice, however. Were it not for the libel laws, I could write a thick book on well-authenticated instances of men and women whose associates think they have good business judgment but who, in asking the assistance of these mental patent medicine venders, show a credulity that would not do credit to a voodoo follower.

And it is certainly justified advice, as you can quickly ascertain the next time you feel like nibbling on their bait if you stay clear of the hook until you have received the advice of the senior psychologist at your nearest bona fide institution of higher education, from your local medical society, from the superintendent of your nearest state hospital, and from the Psychological Corporation. If you do not trust the advice and scientific judgment of such persons, then look in my book "The Psychology of Selecting Men" for more details about the general uselessness of the cults and promotions mentioned as by all means to be avoided.

At the present time I know of a United States congressman, of several corporation executives, of public school superintendents, and a few scientists in other fields, who have a superstitious faith in those present-day necromancers. But I still believe the human race is the apex of evolution.



Psychology's going to work probably means more than the uninitiated imagine it does. For much work has been

needed to make the findings on which the scientific psychologist progresses. It has not been some peculiar inner vision or second sight acquired by psychologists by which they have been able to reach their practical conclusions. They do not need funny whiskers and a penetrating eye. They do not go into a dark closet and after a few moments of abstraction come out with the right answer. There is no unique insight or powerful mental endowment which psychologists must have before they can get the answers. Yet how many intelligent persons imagine that this is true, that psychologists read the thoughts of others, hypnotize foremen, and can cast an evil eye over the poor working girl.

The psychologist might cast an eye at a good-looking working girl, for he is, after all, as human as the rest of the world. He has no mysterious powers or forces or insight which other men do not have. What he knows about human nature and about saving fatigue, about the right job, about morale, has all been learned slowly and laboriously by accumulating data and analyzing them by the same scientific methods that are used in other fields of engineering.

The psychologist is, in short, just another engineer, using the methods which engineers in general follow, to find out about the stresses and strains in human nature. It is in some respects a more difficult form of engineering, since his materials are more variable and at times so intangible that the approach to their study has to be indirect. But it remains essentially engineering—human engineering—and the same methods of laboratory or clinical gathering of data and their mathematical analysis have to be followed. For the past twenty years, these have been followed in order to build up a substantial body of highly useful knowledge. It has been hard work, but fascinating work for those with a yen for it; it has not been a matter of second sight or lucky guesses.

The engineering nature of modern psychology is reflected in the requirements maintained for graduate work in some

universities, where students will not be accepted as candidates for advanced degrees in psychology until they have completed calculus. Perhaps this will help you to understand why you were cautioned about those necromancers who get a following among the gullible, and why the cheap consulting psychologist is likely to be an expensive luxury.



There is another somewhat ticklish point which should be plainly discussed in clearing away the ground for a good headway for the individual business person who wishes to become, as I urge, his own psychologist, or to be at least a bit informed as to psychological facts and to take the attitude that will enable him to use these intelligently in the control of others—and in the control of himself. This is the paradox that although English psychologists are in general far behind those in America, yet in the field of industrial psychology they are so far ahead of us that we find it almost painful.

Although comparisons are both odious and hazardous, I believe it can be fairly said that in this country psychology, as such, has been used for the most part in education and in mental tests. In this application we are distinctly ahead of England, as well as of other countries. In general experimental psychology, also, more work is turned out in the United States in one month than is produced in England in a year. But in the application of the engineering methods of psychology to industry, the situation, to our discredit, is reversed.

There are two significant reasons for this. One reason is the sound organizing ability, conservative salesmanship, and basic scientific stamp which Dr. Charles S. Myers gave to the National Institute of Industrial Psychology, which he organized in Great Britain in 1918 while still director of the psychological laboratory of the University of Cambridge. The other is that they found the ground for their activities in England a more virgin soil. The United States

had been efficiency-minded since the time of wiry Frederick W. Taylor and his pioneering, as an engineer pure and simple, in fatigue study and factory organization. Close on the heels of Taylor followed Major Frank B. Gilbreth, construction engineer, with his ingenious and most successful motion study or motion analysis. A psychological attitude was contributed to this important development by his

wife, Lillian M. Gilbreth, who obtained her doctor's degree in psychology at Brown University for the express purpose of rounding out the motion-study program. Dr. Lillian M. Gilbreth is now a professor of engineering at the Midwest's engineering stronghold, Purdue University.

Our industrial centers and telephone books in 1918 were almost literally cluttered up with industrial engineers, operations engineers, efficiency engineers, and so on. These, in the main, did creditable work though it was not well-rounded because of a lack of psychological knowledge. Often-times it was out of balance in consequence. The only one among them with sound psychological training was the feminine half of the accomplished Gilbreth team. (Their lack of balance, due as a rule to incomplete knowledge of the apparent intangibles of human nature, should be seriously considered as an important factor in causing the gradual eclipse of the efficiency engineer from the American scene in the past ten years.) But these industrial engineers, or whatever they happened to be called, had pretty well filled the field, so there was neither the need nor the opportunity for spectacular progress in the United States similar to that in England.



Founder of Great Britain's renowned National Institute logv. Dr.

The efficiency engineers had accomplished so much, incomplete as it may have been in many places, and had established themselves so firmly, that there was not a wide-open field, for instance, in the lighting of plants or in ventilation, or in materials handling as there was in England. We had our own illuminating engineers and ventilating engineers, even though some of them were simply salesmen with the label of engineer added to make selling contacts easier. Scientific psychologists could not even think of getting a foothold. England, in contrast, was practically without such professional groups, and some of the first and most spectacular work of the National Institute was done in these branches. The only wide-open opportunity for American psychologists was in employment and personnel work.

So one paradox may explain the earlier one. It was the more efficient organization and maintenance of our factories, working methods, and sales establishments, at the close of the World War, which retarded American progress in industrial psychology. American industrial psychologists had the handicap of working against a law of diminishing returns in establishments which already were working much better than competing firms abroad. This is probably why our Psychological Corporation, organized and guided by as capable a man for such work as can be found anywhere, Dr. James McKeen Cattell, did not make the notable practical progress of its comparable English National Institute. In short, our psychologists were good enough, but our businesses and consulting engineers were too



The psychological half of the famous Gilbreth team which developed the work in motion study. Dr. Lillian M. Gilbreth, now professor of engineering at Purdue University.

good. American firms, too, were beginning to feel fed up on efficiency, just about the time that their English brethren first had their eyes opened to it.

But even so, our psychologists have done much more work in industry than is generally known. Much of their work is kept under careful control of secrecy by the firms which retained them, in order to have competitive advantage from it. They may allege the details are kept secret, particularly with tests, to prevent the coaching of applicants, but the basic reason is the profitable advantage of trade secrets. I have plenty of these locked in my own files. In fully half of the reports of work on selecting employees, published by psychologists in the *Personnel Journal*, for example, the account given is intentionally incomplete in the sections dealing with what the test is, how it is scored, and what the requirements are for different occupations or trades. In England there are more reports of work which are not quite so secretive.

How psychology goes about starting to work, and what it does when it has gone to work, cannot be told in a few pages. I recommend that every executive in every firm doing more than a half million of business each year, and each person in business for himself, study "Ten Years of Industrial Psychology," by Henry J. Welch and Charles S. Myers, and a companion book, "Industrial Psychology in Practice," by Henry J. Welch and G. H. Miles. In these books the authors summarize in brief paragraphs what they did and how they accomplished phenomenal increase in output and sales, and decrease in effort and fatigue. Every business library should subscribe to the thin monthly magazine of the National Institute, and all executives should be required to read it for one year. After that they will probably read it without being compelled to do so.

These things are urged upon every executive for, as had been suggested earlier, the psychologist does not have a

corner on using psychology in business. In fact, the place where use of psychology is most needed is among the average run of executives. And the time has come when there is enough sound fact for the average executive to put much into immediate use if he follows the precautions given earlier. My professional colleagues sometimes find fault with my making an earnest endeavor to have firms train their own proved junior executives toward a "psychological slant," instead of trying to keep the field clear and open for the academicians to work in during summers and week ends.

To make this clear, I can do no better than quote from an earlier book of mine, "Psychology and Profits," where I told about the president of a chain organization who "decided to develop his own psychologists from within his organization, using outside professionals only to train his own organization. His younger and more alert executives were put to work reading, discussing, and trying out until he had developed a group in his organization with the psychological attitude who knew where to find psychological information. . . . It is one of the best examples of psychology put to work of which I know, and it was accomplished principally by a group of executives, such as can be found within any organization, who had literally become saturated with the psychological attitude. This illustrates the chief way in which psychology can be of use to management, namely, in training the rank and file of executives to be better equipped to cope with their problems of man power.

"You cannot hire another man to work with your men for you. Only you can do that. That it can be done better when technical knowledge has added to it the psychological attitude has been demonstrated time and time again. . . . Where there is an operator, the man just above should know how to use psychology. There is still a great amount of rule-of-thumb in psychology, but there is also a lot of established fact. The 'man next above' should have a

sound working knowledge of this, regardless of whether he is an employment interviewer or a conveyor specialist."

In my many contacts I find that the average executive is still floundering in the embryonic stage where he expects to become a mind reader and amateur hypnotist after reading the second chapter in a psychological book. Floundering, perhaps, but not hopelessly, for I still believe that the human race is at the apex of civilization, and I know that the last twenty years of psychological endeavor has uncovered new knowledge which has earning power and life value to any firm or individual.

My hope is that more individuals will put to work for them and their firms some of the knowledge which the professional psychologists have worked, as serious engineers, to uncover. After all, it is the executive, and not the psychologist, who needs such new facts.

The psychologist can supply the facts. It is up to the business person to put them to work. If he does not, he should not complain about the salesman who ignores the customer with the money in his hand, for both are passing up a sure bet.

The equipment and the financial organization of business have reached a high point. It is now time for a wider advance in the human aspects of industry. That individual executives should progress in the steps of the industrial psychologists is sharply indicated in the needless and continued strife over hours, conditions, recognition, pay, which for half a century has handicapped both men and management. Nobody has gained, and perhaps nobody will gain until mechanics and finances receive the leaven of humanics. But the humanics must be sound, based upon the fact-finding methods of the human engineer; the pseudo-humanics based upon misleading history, political expediency, the urge of the reformer, the kind spirit of the philanthropist, or the uplift of the social worker have undoubtedly only complicated the problems, so that much must be undone before straight-ahead progress can be noted on a

large scale. Good intentions seldom prove to be anything but bad unless they are based upon scientific fact. I trust the intentions of the reader, but I implore him to become saturated with facts about human nature and human frailties in business.

"The evidence is clear," says Sam A. Lewisohn, "that the training given by our engineering schools does not equip a man adequately to handle so-called 'human engineering.' Industrialists have found that the men who come from such schools are excellently prepared in technical subjects—matters having to do with inanimate things—but woefully unprepared in the art of developing the human beings under them." A few more Gilbreths at Purdue and other schools can alter this situation.

And B. Seebohm Rowntree, the international chocolate maker, wrote: "I have just visited a large number of factories in the United States, and I have been amazed by the high degree to which research departments have been developed.

"But when the heads of these factories pass from the technical to the human problems of industry, the scientific spirit seems to leave them. Their dealings with labor are comparatively crude and unscientific."

Every executive his own psychologist would go far to help this.

CHAPTER 2

WHAT PSYCHOLOGY DOES IN BUSINESS

Psychology has gone to work in business? Well, what can it do?

It has done a great deal—so much, in fact, that already there are what might be called specialties clearly defined in business psychology. Human engineering is unique in the use it has in business, different in one important respect from all other branches which business calls upon for assistance. Business psychology, or human engineering in industry, is *double-barreled*.

It can be used by the individual or by the firm. By applying the knowledge, the individual executive can strengthen and advance himself in the understanding and control of himself—that is one barrel; he can also better understand and control others—that is the other barrel.

So, as we start our survey of what psychology does in business, to map the field which we shall cover in detail in the rest of the book, the reader should keep in mind both barrels and should think of the advancement of himself as well as of possible applications on a larger scale in the business itself. In the preceding chapter we found that each executive can be his own psychologist and can make use of psychology for his own purposes, even in the most backward firm, which is set against all newfangled things.



One way for putting psychology to use in business is in the selection of the best worker for a particular job, and (the other barrel) in the individual's finding out the type of work for which he is best adapted by his own highly individual nature. Patrick Henry was a fiery-tongued

A test of "mechanical intelligence"



The start—nine wiggly blocks to be put together in perfect fit.



Three minutes later—puzzled, but still showing headway.



Five minutes forty-five seconds after starting—the last wiggly block is slipped in place. Some college graduates cannot put this together in a full hour.

orator but could not write an intelligible report. He would have been an occupational misfit, had he been in charge of correspondence for a concern. With Washington Irving, it was just the opposite; he would have been a misfit as a speaker.

Until recent years, the discouraging and expensive process of try-jobs-until-you-find-the-right-one has been the only one to follow. This has cost industry many dollars and has cost mankind probably much more in discouragement and failures.

Psychology can now tell, in many instances, whether or not an applicant is fitted by his nature for certain work. At a Connecticut high school, for instance, it was recently found that about half of the pupils were planning to enter work for which they were not fitted by nature. The psychologist at this school rendered inestimable services to the several hundred whom it became his hard duty to direct into other occupations.

There are still, however, innumerable occupations for which psychology has no way to judge fitness. Many psychologists are now engaged in experimental work to lessen these charted occupations, but the number of workers and the funds are grossly inadequate, in comparison with the need.

B. Seebohm Rowntree, the well-known British industrialist, comments upon the usefulness of psychological help in placing workers by saying: "Our experience is that before we had the assistance of psychologists, we placed 80 per cent of our work-people correctly and the other 20 per cent incorrectly. Now the figures are 95 per cent and 5 per cent."

Another way in which psychology has gone to work is to find out the best conditions under which work can be done. Factory lighting has been changed, in instances, so that output is increased 25 per cent and eyestrain greatly

lessened. Records have shown that when the temperature rises to 90° clerical errors are increased by over half. So temperature controls are installed which keep the mercury at the optimum point, depending upon the type of work being done. Such control installed in some tin plate mills has practically eliminated the usual summer discomfort and slump in production. Noise has also been surveyed and brought under control.

The best methods of doing work are studied, as well. How to lay bricks so that



Cutting a notch, about one inch each way, in one corner of carbon paper makes it much easier to handle.



Holding the top sheet and second copy between thumb and finger where the carbon is notched, it is easy to pull the carbon itself out at the bottom.

scarcely six, rather than the usual fifteen, motions are required was discovered by the late Major Frank Gilbreth.

A work bench for repairers of gas stoves, for example, was designed by psychologists so that fatiguing stooping and bending were practically overcome. Hundreds of illustrations could be given, and many having more common use will be given in detail later.

The elimination of the countless useless motions usually made when the work is not planned by psychologists has saved many miles of lost motion for the workers of industry.



Search—hunting for what is wanted—is lessened in the laboratory by having the curves plainly visible over the drafting board.

The substitution of hand and body motions which are least fatiguing has saved many hours of unnecessary fatigue.



The psychology of self-realization, self-expression, and satisfaction also has a prominent part in these triumphs of psychology going to work. The monotony about which so many outside of factory walls lament is quick to take wings.

The worry of accidents is lessened, as in a small repair shop where workers were afraid of rupturing themselves in trucking heavy castings over a rough floor.

The satisfaction in the job as a job is a task for the psychologist. Surveys have shown that about half of the workers of the world are dissatisfied with their work. In

those plants, however, where psychological steps have been taken to make the work interesting and self-expressive, scarcely one-fifth of the workers are dissatisfied.

Being in the right job, of course, is related to the feeling of satisfaction, or morale. A statistical basis for judging the improvement which results when psychological methods of finding out the best job are used is found in the records of the National Institute of Industrial Psychology. Their psychologists sized up by psychological techniques, such as we turn to in the next chapters, 100 young people who were just entering industry. Two years later, they checked up on these 100 children with the following findings:

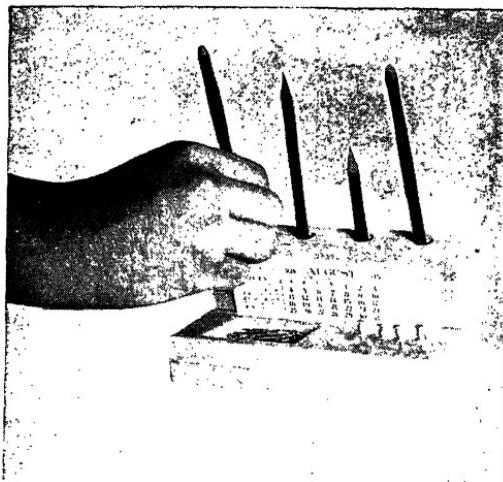
" . . . of those who had entered occupations of the kind recommended, over 80 per cent were satisfied with their work, prospects, and pay. On the other hand, of those who had obtained employment different from the kind advised, more than 60 per cent were dissatisfied; and of those among the latter who were satisfied, most appeared to be so rather because they had exceptionally good employers than because they liked the work. Further, those who had entered occupations of the kind recommended were, on the average, in receipt of higher pay, generally obtained promotions earlier, and experienced fewer changes of situation."



One hand can often do the work of two, and easier. Here pressure on the lever at the right, with the little finger, raises the stopper from the bottle of drawing ink for filling the drawing pen without taking the other hand from the work.



The eyes do not have to be used when one side of the rubber stamp is flattened. The thumb fits on the flattened side and the stamp is always printed right side up without bothering to look at it.



There is fatigue saving in this desk rack, modeled after Gilbreth's, which the author uses. Pencils are *prepositioned*, ready for use just as they are picked up. The blue pencil is hexagonal, the red pencil is round, so eyes do not have to be taken from their work to know the color; the colored pencils are sharpened on each end—cutting in half the trips to the pencil sharpener. And thumbtacks with knobs in place of round heads are easier on both nerves and fingernails.

What Psychology Does in Business

Sales have been helped when psychologists tested out several possible package designs for a product. Sales resistance has been broken down, and sales cost lowered, by psychological studies, and by test of color, flavor, finish,



Three things to note and remember from this photograph of girls operating key punch machines in preparing tabulating machine cards: (1) Posture chairs, individually adjusted to the body build of each operator, (2) the special rack which holds the statistical matter they are following, and (3) the new semi-indirect study lamps for each operator. (*Courtesy of General Electric Company*)

design. Sales presentations and advertising appeals, also, have in instances been revised and rejuvenated.

A wide swath is taken in by psychology in business, from conveyors to credits, from the yard laborer to the president and his mental health. Wherever a human being enters the picture, psychology of a sound sort should also enter; in many instances psychology does enter, and it will doubtless continue to enter into business more from year to year, as

the executives, who must be their own psychologists most of the time, gain a better working knowledge of its utilities.

Psychology, like industry or government, could be made a giant Moloch to consume the workers. Not in one of the many cases of its use in American or English industry,



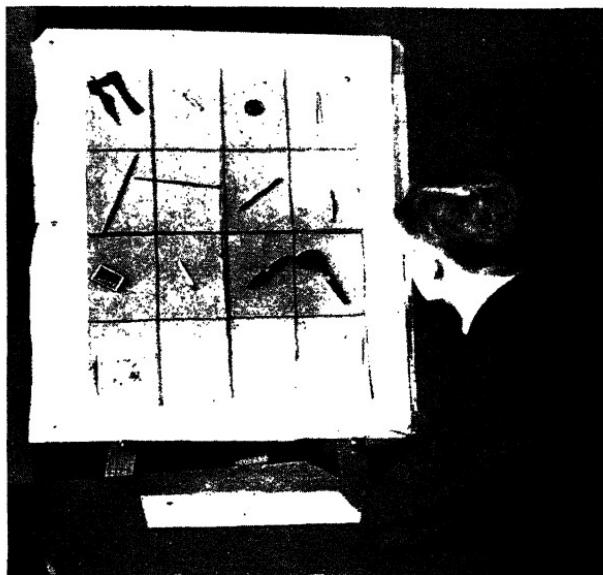
A blindfold study of how women like or dislike the "feel" of different fabrics, conducted by psychologists, uncovered valuable information about the sense of touch in merchandising fabrics. Both the product and the consumer are studied in relation to each other by psychologists. (*Courtesy of the Psychological Corporation.*)

however, of which I know personally or have heard, has this been done.

In Russia, matters are different in this respect. There psychologists have gone to work with printers, carpenters, locksmiths, bookbinders, telephone operators, clerks, trolley-car workers, and in the Red Army. Of their work a recent observer writes: "The welfare of the Worker so that he and his employer may ultimately benefit by better and easier conditions of work has been entirely overlooked. The psychologists of Russia are mainly concerned with

increased output and not with adding to the mental or material happiness of the workers. The Russian workman is thus destined to become a pure automaton, without initiative, without soul, without any inspiration to work."

This is *not* putting psychology to work.



The retail sales clerk should remember where his stock is located. In this ingenious test of place-memory sixteen common objects are shown the applicant for a definite, but short, time. Later he is tested to find out how well he remembers what goes in the blank spaces with the articles removed. (*Courtesy of National Institute of Industrial Psychology.*)

Contrast with the Russian use of psychology in business the guiding philosophy of the National Institute of Industrial Psychology, as given in the report on "Ten Years of Industrial Psychology":

"The Institute's principles from the outset were not to press the worker from *behind*, but to reduce all causes of friction and resistance—both physical and mental—from the *front*. Sometimes, of course, tradition and habits of slack rates of working, often due to slackness of management, had to be eradicated. But as a rule, it was the sources

of irritation, worry, fear, needless strain, and boredom that had to be diminished, and conditions of greater sympathy, interest, satisfaction, cooperation, and contentment that had to be established."

So it is little wonder that where the aim has been to lessen fatigue and irritation first, in the realization that then output and dividends will better take care of themselves, workers in plants where enormous changes have been made by the psychologists of the Institute have spontaneously exclaimed over the results to them—the workers—in these exact words:

"The work is much easier: we are in clover now."—
"Could we not have more like this? It has made it a lot easier for us."—"It feels much safer now: we can get on with the work much quicker."—"It is much better now: we can stick to the job without being fussed about."—"It's fair now: it divides the work up—share and share alike."—"When we heard of the changes you were giving us, we were that glad, we all felt six foot high."—"I wish you had been here when I was a girl; I wouldn't look the old hag I do now."—"This place is not what it used to be: you are not shouted at now, and there's not so many gets the sack."—"They are very particular here about the work, but it's far easier now when you are shown the right way."—"I worked here before any of your folk came near the mill: how on earth did they get on without you so long?"

This *is* putting psychology to work.

CHAPTER 3

HOW PEOPLE DIFFER IN BUSINESS

The right man in the right job is so far from a common occurrence that in place of being a dream it should be a nightmare. Letting things take their course and hoping for the best have kept on at considerable human as well as business sacrifice. How poorly adapted many persons are for their jobs is dramatically shown by a comparison of the production of a number of workers at the same operation.

For a few moments I want to take you to an Ohio coal mine. We shall not go down into the mine but take a look at the production records on file in the office. This particular mine is one in which mine cars, picks, and powder are supplied to the workers without limit. Their output is in no wise restricted by any limitations in tools or other equipment.

We are not interested in the records to which a cost accountant usually gives most of his attention, but will inspect the records of output of individual miners. These are the output weight records of each miner over a two weeks' period. From these records we find that some workers loaded 1,845 hundredweight of coal in such a period. This was the output of $5\frac{7}{100}$ of 1 per cent of the workers. We find, besides, that some of the workers loaded only 154 hundredweight in the same period. Here, also, $5\frac{7}{100}$ of 1 per cent of the workers had this smaller output.

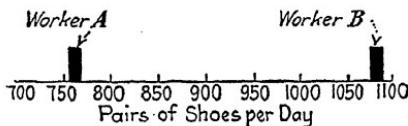
The best workers produced almost twelve times as much coal as the poorest. This is a fairly typical example of human differences in modern industrialism.

The men are paid according to the amount of coal that they load, but it is obvious that the poor miners add to the

How to Use Psychology in Business

expense of the coal by the larger overhead incidental to their low production.

If we go now from the coal mine to an insurance office and examine the records of the sales of men with an equal amount of experience, we find even more startling differences than the twelve-fold difference discovered in the mine. The ratio of sales made by full-time solicitors with equal experience has been found to be as high as 350 to 1, i.e., the best men sell 350 times as much insurance as the poorest.



When two heel trimmers are compared individuals appear to be separated by a large gap in productivity. (*Industrial Fatigue Research Board, Report No. 10.*)

Let us go to a shoe factory. We find one heel trimmer turning out 1,090 pairs a day, another only 765 pairs. Among the bottom scourers, one turns out 490 pairs on an average day, another averages 245 pairs a day. In the consol-lasting department we find one worker turning out 210 pairs in a day and another unable to do more than 130 pairs.

In silk weaving, the best operator in one department had her loom in operation one and one-half times as many minutes each working day as the poorest operator on the floor. Figure the overhead on the poor workers! In one cotton mill, the piecework earning of the best was twice the earning of the poorest. The piecework earning of the best hosiery maker, also, was almost twice (lacking only one-tenth) the earnings of the poorest. In polishing silver spoons, the best girl had slightly more than five times more output per day.

And of those who are in business for themselves, take taxi drivers in Philadelphia, who are given the use of \$2,000 capital (in the form of the taxicab) by the company. The

forty best drivers earned for themselves, on the average, \$1,626.74 a year; the forty poorest earned an annual average of \$1,069.91. There was the same capital outlay for each, the same equipment, the same opportunity on the pavements of the haven of brotherly love, but some drivers consistently earned for themselves 60 per cent more than did others.

Psychological measurements of various mental powers show even greater differences in some functions. A study of



How people differ in speed of movement is measured by the tapping test. The girl taps as rapidly as possible on the metal plate, the electric counter recording the taps per minute.

107 pupils starting high school, for instance, showed that in general information the best is nineteen times better than the poorest. In speed of writing, the best child was five times ahead of the poorest. In quality of writing the best

was ahead by only three lengths, almost three and a half ahead in speed of reading, nearly six ahead in immediate memory, five ahead in following easy directions, and ten ahead in self-confidence.

It was not the same pupil who was the poorest on all the tests, of course. Such a child would probably have been in another school—a school for the feeble-minded. Nor was the same pupil the best in all the tests. A pupil of that rating would be an infant prodigy who would not be heard from after leaving college at a tender age. All human beings have their ups and downs in ability, their strong points and their weak points. The tragedy arises when the demands of work and the person's weak points come together.

There is no doubt but that if we were to make a survey of every industry in the United States we would find that the best one per cent of workers produce twice as much as the poorest one per cent. The true significance of these human differences may be better stated by saying that 400,000 of the persons engaged in gainful occupations *produce half as much as* 400,000 others who are better adapted for the work in which they are engaged. From the point of view of national economics this means that the 400,000 poorest workers could be replaced by half that number, if workers in other occupations with twice this particular ability could be found. And there is every reason, and much experience, to indicate that they can be found.

In a New England printing plant, for instance, a force of 900 workers had been considered necessary to produce the usual output. A new employment manager, who was keenly cognizant of these human differences, initiated a sound psychological policy. When a worker left the firm, his position was filled, not by inserting a want-ad and engaging a new worker, but by transferring a worker from another job. The worker who was transferred was one with low production in his former position. This transferring was continued until each man was in the position for which he had fullest capacity.

In a very few years this brought about the result that the production of the plant was carried on by a force of only 500 workers, each one of whom was in his one best job, so far as printing was concerned. The 500 workers carried on production at the same rate that 900 had previously maintained. Is that of significance to industry? It was a kind of cost accounting, or rather of output accounting, applied to each individual employee that made this almost phenomenal change possible. There was nothing miraculous about it; just cost accounting applied to individual workers, and the findings put into action.

The printing plant I mentioned ascertained the abilities of its workers by a trial-and-error process. A worker was tried at one occupation and then at another until that one was found in which each was at his best and above the average.

When the workings of a concern change, through a new invention or a change in the kind of product, there is likely to be much hardship on the workers who are not familiar with, or *adapted* to, the changed operations. That is a time when craft reeducation is needed, and when it should be guided on the basis of a man's aptitudes. Read this account of such a situation and how it was handled, from the *Business Week* of July 6, 1935:

"A successful experiment in craft reeducation is reported by Nash Motor Co.'s Milwaukee affiliate, Seaman Body Corp. Nash's change-over from wood-and-steel to all-steel body construction affected every third man of the plant's body assembly workers. The deposed woodworkers were encouraged to choose their new occupations. In many cases the foremen made corrective shifts. Sometimes, a man was tried on six jobs before finding one he could master.

"The woodworkers were placed among trained crews as apprentices at apprentice wages. They graduated to skilled status when the foreman decided that reeducation was complete. About 4 weeks was required to adapt the men to arc and acetylene welding. In addition they mastered flash

and spot welding, upholstering, painting, trimming, sound-proofing, wiring. New luxury items inside the cars created jobs that did not conflict with established trades. Some



Differences in muscular coordination can be measured by the three-hole test. The girl pushes to the bottom of the holes, one after the other, as quickly as she can, going round and round in the direction of the hands on a clock.

300 men of from 24 to 69 years have been readjusted in a little over a year."

The differences between the best and the poorest operators, coming close to a two to one ratio on the average, should cause some serious thought about our too-implicit faith in the power of the machine. All of the factory workers cited in the earlier section were working in places equipped with modern machinery, yet some consistently turned out approximately twice the product accomplished by the others. All the workers were experienced, all had the incentive of working for themselves on a piecework basis. But some just could not come up to the average.

The introduction of machinery has not made business any less independent of the human being. Rather the

opposite is true, in fact, the poor worker now restricting the output of a \$2,000 machine. The machine magnifies the importance of the worker. When a man slows down in operating a machine which does the work of ten men, he is slowing down not one man but ten.

Mechanize industry all you possibly can, and the individual operative will still be the bottle neck of production. Whenever a new machine is adopted, there is a job for the psychologist.

All this talk about the "best" and the "poorest" worker may cause us to overlook the most important of all—*the average worker*. Salesmen, businessmen, bottom scourers, hosiery workers, and all cannot be divided scientifically into two groups of the good and the poor. Human nature and work aptitude shade gradually from one extreme to the other, with most persons in any occupation grouped around the middle—the average. This is called the normal distribution curve and is important to keep in mind.

There are some lazy people seven feet tall and a few cocksure fellows not quite five feet tall. We can see even more difference in height between the giant and the dwarf at the circus side show. But most of our friends and our employees range around five feet ten, the average height. For height, like work aptitude, is found in human beings in a normal distribution curve; there are a few at each extreme, of course, but most are in the middle between the extremes, and a few—say, 10 per cent—too high for the average but not at the extreme, and another 10 per cent too short to be average but not yet of shrimp size.

All the qualities and traits of human beings, of all living things for that matter, are ushered into this interesting world according to a curve of normal distribution. One may find himself at the average point of the curve of height, at the low extreme in legibility of handwriting, about average in skill with hands, and so on.

We should not gather the idea that the strong points always counterbalance the weak ones so that the net

How to Use Psychology in Business

result is an average. As we shall see in the chapters immediately following, some persons range up and down, but mostly on the high side of the normal distribution curve; and there are some who fluctuate around from quality to quality, but pretty consistently on the low side of the scales. The practical problem is to discover the general all-around range, as well as the individual's strong spots to be capitalized and weak spots to be kept from being called upon in his daily work.

In a medium-sized western town there were three "general electricians." Each did a general contracting business and had a store in which appliances and fixtures were sold. Trouble developed in the hall fixture in our house.

Being a newcomer to the town I asked our next-door neighbor which electrician I should call.

"Well," he said with a twang harking back to New England rather than to the West, "Smith is the best for tinkering with electrical machines in which something goes round. The short fellow, Humpstone, is the man to go to for heavy outside installations.

"That fellow who looks too sleepy to know what it's all about, Murphy, is no good at anything but fixing trouble in fixtures. You call him. But when something is wrong with that trick dishwasher you brought with you, call Smith."

The following day our neighbor inquired if the fixture was working. After being assured that it was better than new now, in reply to thanks for directing us to the right man for that work, he said:

"Beats the Dutch, doesn't it, how three men who think they are doing the same work aren't. Sort of a spontaneous specialization, to use hifaluting words like I suppose you're used to. Now if the three of them would go into partnership this town'd have a first class electrician's establishment.

See the same thing in railroading," and he started across his lawn with a vicious push of the lawn mower.

When illness came and we needed a physician, we received the same kind of advice—including the comment that our neighbor wouldn't trust one of the doctors round a sick dog.

Later we discovered three farms side by side. One was a truck farm, another raised only sheep, and the farm between these was owned by a retired minister who had it planted to alfalfa and sold the crop in his fields to neighboring farmers. Each had specialized spontaneously.

The specialization of our modern industrial world has been as natural and as inevitable as that of the three "general electricians." Industrial occupations have been specialized to a greater extent than those electricians had specialized. But if the electricians had specialized more, perhaps my railroad neighbor would not have given his lawn mower such a vicious push.

Specialization has been inevitable because human nature is specialized. Peas from the same pod may be alike. Children from the same family are not. Even so-called "identical twins" can be distinguished in appearance by their relatives, and an alert stranger can tell them apart by watching their actions and observing their mental responses for fifteen minutes.

That no two individuals in a million are exactly alike in psychological abilities is a safe statement. Yet it was not many decades ago that industry was so unspecialized that all shoemakers, all farmers, all blacksmiths, practically all workers in fact, had to do almost exactly the same sort of work. There are many occupations at the present day which require all following them to do exactly the same thing, of course. There are actually thousands more of occupations now, however, than "in the good old days." This makes just as many more thousands of chances of the worker's having work that will fit him, but he may have to try several thousand before he discovers the right one.

Visitors to American shops from foreign countries that are industrially backward are impressed by the happiness and by the zest for work which American workmen exhibit. A country backward industrially does not have specialization. Yet specialization is spontaneous every time you give the worker a chance, and in backward countries many times the workers are struggling along against human nature. So why should not the specialized worker have more zest for his work and get more happiness out of life? The countries which will give us severest competition in the world markets are those with specialized occupations.

While specialization has been inevitable, it has brought with it a group of serious problems.

Each week I receive from two to a dozen letters which deal with one problem specialization has precipitated. By some means the writers of these letters—whom I have never seen or heard of before—have found that I am interested in selecting workers for work. Practically all of them are employed but dissatisfied with their work. What especially bothers them is not pay but doing work that they do not like. What each is in need of is guidance into the best job, into the work which will give him opportunity to realize the highest and most useful abilities he possesses.

Last week I was talking with the medical director of a large insurance company.

"Before specialization had really arrived," he said, "the skilled worker used to spend part of his time as a messenger boy, gathering raw materials and carrying the finished product away. Mechanical conveyors do that now. The worker can do his special work without being a truck horse in addition."

"The serious side of this," he added in a tone of warning, "is that the worker is apt to get too little exercise. Sitting at a bench all day long does not prolong life. The modern worker must be careful to get regular exercise, either in a

daily dozen or in recreation which puts into play the muscles not used in his specialty."

All through history we find records of people who have been able, through fortunate circumstances, to specialize. These are historical personages. The millions who could not specialize just toiled and passed into oblivion.

CHAPTER 4

HOW AND WHY PEOPLE ARE DIFFERENT IN GENERAL ABILITY

We have just seen how all persons have high and low spots in their abilities, and how there is a tendency for some to have their abilities cluster at the high end; others, at the low end; while in most of us they cluster round the middle, producing the familiar "average" man or woman.

This sum total of a person's high and low abilities gives a widely used and highly serviceable index of what may be called general ability, or general intelligence. In human nature there is much more than this thing we are calling general ability, as will be found in later chapters; but we can learn most about human strengths and shortcomings by finding out all that is now known about what is called general intelligence. Perhaps more experimental work has been done on the subject of intelligence than on any other aspect of human nature. This suggests the importance in which we should hold it. It is a factor which cuts across practically every human activity.

The commander of a great army training camp during the World War, for instance, was busy attending to the preparation of regiment after regiment of newly made soldiers for active duty in France. Through all the hustle and bustle of his work he noticed that a regiment, otherwise fitted to embark for foreign shores, would have to be kept back for several weeks on account of the slowness of a single company to master the rudiments of soldiering.

A whole regiment delayed because of one slow company! Because a few others were slow to learn, men were being kept from France—and just when there was crying need for men.

The commander thought at first that the officers might be at fault; but when a transfer of officers brought no noticeable improvement, he began to wonder if their slow progress might not be due to the men themselves.

When psychological work in the army was organized, the psychologists brought an answer to this troubled camp commander, and an answer that is incidentally of immense significance to every businessman—the relativity of general ability.

Remember back in the elementary school how the oldest child in the class was an undersized boy who answered to the name of "Shrimp"? Then, in contrast with him, was the youngest member in the grade, a chubby, chunky girl who was tormented to desperation by the boys, who called her "Butter" and "Fatty." These are not unusual cases of individual differences in size.

"Butter" was promoted because she outgrew the seats in the lower grade, and "Shrimp" was not promoted because he enjoyed life and the fun of bothering his teachers too much to be concerned with his studies. Everyone in the grade knew that "Butter" was dull and that "Shrimp" was as smart as a whip.

School children of the same age may differ markedly in height and weight, but they may differ by as much as 300 times in musical ability. Physical differences are nothing compared with the enormous differences that may be found in mentality.

In a single classroom, supposedly devoted to the education of children of the same age and mental abilities, startling differences in mental powers have been discovered. Professor Lewis M. Terman studied a class of fifth grade children; in this he found some children with a mental equipment capable of doing the work of the first year in high school, while others in the same grade had a mental level equal to that of the average child in the first grade. There is individual difference for you!

What is true of school children is true for high-school children, college students, and adults in business and industry. On the outside folk may look equal in mental ability, but it is inside information that counts. In any tasks above the most menial, brain power, or general ability, counts



How to adjust the height of work places. With the palms upward and the arms held limply in front, the bench top should barely touch the knuckles of the hands. This bench top—thirty-one inches high—is about two inches too short for this worker. Some factories have one assembly line two inches higher than the other to take care of individual variations in worker build. *Adjustments should also be made to the mental differences from one worker to another.*

most; and even in the case of the most unskilled day laborers, brains make a great difference.

In earlier days, the only way to estimate a person's brains was to try him out in a job and see if he made good. But, of course, that was an expensive way to proceed. If a person was tried for a month, receiving pay all the time, and then was found not to be able to make good, the process was a costly one.

It is not safe to judge intelligence by the work a person is doing. Intelligence tests were given to a group of ordinary day laborers engaged in digging sewer ditches. In this group some men were found with an equipment of brains equal to that of the average lawyer. Still, these men were content

with digging ditches. They were serving in this world as ditchdiggers when they had the general ability to make good lawyers. Ditchdiggers are necessary, of course, but why not demote some of the poor lawyers to this task and let the intelligent ditchdigger study law?

One of the most significant figures in the history of American literature, Edwin Arlington Robinson, worked as laborer in the building of the subways under New York City. This man, who was discovered by Theodore Roosevelt and who won the Pulitzer prize three times, is only one example of the ability which may be hidden.

Mere opinion about intelligence or brains is not at all trustworthy. Teachers in a California city school system were asked to pick out among their students those whom they thought to be feeble-minded and in need of special attention on account of this deficiency in brains. The teachers selected half a hundred pupils as feeble-minded. Then psychologic tests were given, to determine whether these teachers had good judgment in the matter. The results were embarrassing to the teachers.

In the group of children that the teachers called mentally deficient were found a few much above the average in brains. Such was the case of a little boy in the fifth grade. His teacher thought he was feeble-minded, but he was in reality the brightest boy in the grade. He was two years younger than the average child in that grade and still he managed to do fairly good school work.

Intelligence, or brains, cannot be estimated; in order to find out how much there is of it or how well it is working, tests are necessary—tests that test brains and not education. There are dozens of such tests now. A specimen test is given in full, starting on page 289 of my book “The Psychology of Selecting Men.”

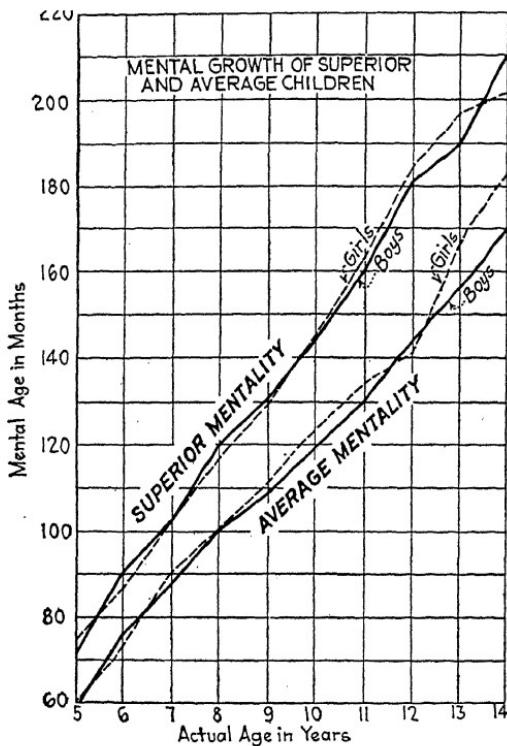


A group of 14,000 college men who had been drafted into the army were given the regulation army test of intelligence

How to Use Psychology in Business

that was developed by psychologists. This large group made an average score of 97 points on the test.

Then a group of army officers were selected. There were 660 officers in this second group. Not one of the officers had



Children who are average in intelligence in kindergarten remain average all through school, while those who were of higher intelligence at the start of their elementary education possibly gain a little. These children were all attending the same school, and had their intelligence measured once or more each year.
(Data from Iowa Child Welfare Research Station.)

had as much formal education as the college freshman, and yet the average score for these lesser educated officers was 107.

Ten points difference! It was not education that was being tested, or the college men would have ranked higher.

It was brains, general ability. Some tests of intelligence have been used that do not involve language at all.

Education improves one's regular equipment of brains only slightly. Children who are found by tests to have a little less than the usual modicum of brains in the first grade are still about the same distance behind the average child when they are in the fifth grade, and in case they reach the eighth grade, they still test proportionately below the average, or so-called normal, child.

Intelligence is not increased by going to college. Neither is it a chance affair. As a rule, parents with brains much above the average have children with brains much above the average. The children of families of the professional classes test about 30 per cent above the average child, the children of business families rate about 20 per cent above the average, children of unskilled laborers rate about 20 per cent below average.

Brains seem quite definitely to be inherited, just as are eye color, stature, and possibly temperament. When occasionally in a family of unusual brain quality one mental black sheep, a feeble-minded child, is found, the case may be explained by the same laws.

It does not contradict the laws of inheritance; rather do just such cases help to prove the inheritance of brains. Everyone has noticed cases in which children resemble neither parent nearly so closely as they do one of their four grandparents. The children of feeble-minded parents likewise are usually deficient in brains to the extent of feeble-mindedness. If only one parent is feeble-minded, about half of the children may be feeble-minded, while the other half seem to be fairly normal.

Although half of these children seem to be normal, in their bodies they carry hereditary determiners that may cause the appearance of a feeble-minded grandchild. The same is true of color-blindness. A woman who is normal in distinguishing colors may have three brothers, all of whom confuse red and green. Of the children of this woman, the

boys may be color-blind, while her girls may be apparently normal. This type of inheritance is somewhat different from the exact type of inheritance in general ability, but it does show how apparently normal parents may transmit undesirable characteristics to their children. Brains are inherited.

If education does not improve intelligence, what makes college men successful? Of the hundreds of thousands of men tested in the army during mobilization, the average score made in the test was 65. After the war, the same test was given to a large number of students entering college for the first time. The average score made by the freshmen was 150. This does not mean that the college freshman had twice as much intelligence as the army man, since the army scale does not start with a zero score meaning zero intelligence. But this difference does mean that the ordinary college man is much better equipped with brains than the average man on the streets.

Perhaps this is one reason why college men—some of them—are successful. It may also be the reason why some men who never saw a college are successful—they have the brains anyway.

Picture the opening day of a grade school in which there are 100 children entering school for the first time. Eight years later let us follow the same pupils and see what they are doing. We shall find about a third of them entering high school. The other two-thirds have left school and gone into offices and industries; most of them will be found in industries. The thirty-odd children that are entering high school are the ones that made the highest marks in the intelligence test given them eight years ago. The children that dropped out in the fifth grade were the ones that scored lowest—they are probably ordinary laborers now. Some others dropped out in the seventh grade. They were below in the

brain test also; there are a few mechanics and semiskilled laborers among these.

It would be interesting to follow through life these citizens in the making. Let us see what happens to the thirty-odd who are lined up at the entrance of the high school. Four years hence we shall find less than half of them seated on the platform ready to receive their diplomas.

The original group has been weeded out until only fourteen familiar faces are seen. Some of these receive diplomas in the commercial and vocational courses. A few of the remaining fourteen receive diplomas of the regular course that prepares for college entrance. Let us look in our notebooks and notice the scores these made in the intelligence test twelve years before, as they were entering school.

It is uncanny! All these fourteen are the ones who did best on the test when scarcely more than infants. Those who are receiving diplomas certifying that they have completed a commercial or a vocational course made lower scores than those now preparing for college entrance.

The other side is equally interesting. We shall leave these embarrassed high-school graduates on their commencement night and ferret out the children that left school in the fifth grade. One has attended night school and secured a responsible and remunerative position. He left school, so we find from our notebook, because his father died and he had to help support his mother and his smaller brothers.

But if we go to an employment agency at Columbus, Ohio, as did Professor Rudolf Pintner when at Ohio State University, we shall find among the men lined up for inspection some familiar faces. These are men without jobs; they were without jobs in a period during the war when men were at a premium and wages were high and appealing even for the most unskilled of labor. There are stalwart men in line, but not one of them succeeds in holding down a job for more than a month or so. They are the labor floaters, the

drifters, the odd-jobmen. We look into our notebooks again and find that one out of about every four men in the line is feeble-minded. The average of the group can do no more on an intelligence test than a normal boy ten and one-half years old.

It is not capital, unfair competition, or labor discrimination that has made these men floaters, men without job or family. It is the same thing that has made some of the college men successful—brains, a matter of relativity. This is something we should consider in devising our doles.

These persons with low general ability are more numerous and cause more of a problem than many realize. Surveys among the casual laborers of the West and Midwest—those floaters who shift from harvesting sugar beets to the wheat fields and to the California fruit and hop harvests—reveal that every third man, or woman, in their number is so deficient in general ability as to be plainly mentally defective. When the problem of handling the unemployed and the unemployable is dealt with, these factors should be borne in view. Estimates average around there being nearly one million feeble-minded persons at large in the United States, persons unable to make good on any job. Yet there are evidences—to be taken up in a moment—that these persons with woefully inadequate general ability are those who are increasing in numbers.

Recall that estimate of a million. Then consider these facts, to see that it is probably conservative. During the World War the medical examiners of the local draft boards kept many obviously feeble-minded men from being sent to camp. Yet from among the young men sent to the camps there were 7,800 discharged because their general ability was scarcely higher than an idiot's. Around 10,000 were still kept in the army, but they were of too little general intelligence to be of any direct military usefulness and therefore were placed in development battalions, where they peeled potatoes and picked up the scraps of rubbish and paper from the drill grounds. There were, in fact, 46,000

men kept in service who did not have more general ability than the average ten-year-old child, back home in the grade school. These were grown-up men, but only those between twenty and thirty years of age. Do some figuring to see what the total would have been if all age groups of men, and if women as well as men, had been included!

This problem of a growing number of persons with actually inadequate general ability has become worse with each generation and will probably keep on getting worse unless business leaders awake to the situation. The birth rate is inversely related to general ability, for some reason. The smaller the general ability, the larger the number of children and the more varied the parentage of the children. In 1934, it is said, there were one million children born to persons on the dole. In this way the problem of the dole will become a self-perpetuating octopus leading directly to national decay.

Each generation has seen some lowering of the American average level of general ability. Although we now have practically no immigration, the lowering process is still going on insidiously and almost irrevocably, due to the differential in the birth rates of the various ability groups. The dull peasant is steadily taking possession of the land which was opened to the world by hardy pioneers of high average ability.

The tail is now wagging Washington and Wall Street and LaSalle Street.

It is not the general ability of our politicians and national leaders which should cause us concern. It is the general intelligence of one-fourth of our neighbors, of those who live "across the tracks," in the slums, or are content to live and raise large families in weather-beaten shacks on exhausted farms.

Selling merchandise must be done in the simplest possible terms to this fourth, or possibly more, of the general population. Industrial tasks, also, must be expressed in pretty simple terms for them. The business of simplifying both

sales and jobs to fit the general level of the population varies from one section of the country to another, as does the problem of the dole.

We are now going to take up some facts which will irritate many Chambers of Commerce. I shall not blame them at



Exhausted farm lands—or depleted general ability? These farms are side by side. The difference in prosperity, readily discernible in the photographs, is not due to differences in soil. The one farm is worked by a family with almost twice the mental age of the other. Neighbors with the same agricultural opportunity, but some vital differences not explained by soil chemistry or economic theories, produce an enormous difference in what is taken out of the soil.

all for taking offense, but this situation is so important and the facts so critical that it would be crass negligence to gloss over them, as has been all too commonly done in the past. We have a rather blind tendency to accuse crooked utility magnates and grafting welfare workers for our national ills, but some not-too-pleasant truths may open many eyes to

something in the vortex of our national crucible more significant than a few hypocrites in high places.

Although we might cite any one of nearly two dozen states, we will first mention by name Vermont, because that is a place studied by the late Dr. Pearce Bailey. It would be, he wrote, "safe to assume that there are at least thirty defectives per thousand in Vermont of the eight-year-old mentality type, and 300 per thousand of backward or retarded persons—persons of distinctly inferior intelligence. In other words, nearly one-third of the whole population of that state is of a type to require some supervision.

"In addition to the lowering of the general intelligence brought about by an overproduction of mental defectives plus the dullards who are always found with them, the outlook for the general intelligence is further impaired by the reduction in the chance of the appearance of persons of superior intelligence with the qualities of leaders."

Here is an honest and aboveboard list of the states which have the lowest amount of general ability among their citizens, a listing which is usually kept out of sight with the other family skeletons. The first one on the list is only slightly below the average of the country, the second one a little below the average, and so on, until the one at the bottom is so far below that we might almost be better off if we gave it back to the Pima Indians.

Florida
South Dakota
Oklahoma
Georgia
Vermont
Missouri
Mississippi
Alabama
North Dakota
West Virginia
Kentucky
Tennessee
South Carolina
Arkansas

Maryland
Virginia
North Carolina
Maine
New Mexico

Note, for one thing, that there is not an industrial state in the list. For another, note that they are all states which in proportion to their population contribute little to the nation's tax receipts, or to art or letters or science. And, for another, look over the last reports on the distribution of the dole and see how those states are heading the list on per capita gifts from the pockets of the taxpayers in other states. (The high rank of North Carolina as a Federal revenue producing state does not belie its position on this list—it produces a high Federal revenue because most tobacco taxes clear through that division.)

In 1934, for instance, the states on the above listing had 15.6 per cent of their population on the relief lists. The remaining states had only 11.2 per cent of their population on the relief rolls.

The businessman's burden is found where there is in the population the largest proportion of those who cannot figure out how many pencils they could buy for a quarter if the pencils sold at two for a nickel. The large proportion—larger in some states than in others—of persons who cannot, through inborn lack of general ability, make even simple calculations and purchases or plan their work for themselves, these are focal spots of economic dry rot which spreads until it draws down those who have enough general ability to be frugal or thrifty. Finally, other states are drawn into the maelstrom. Why do so many people still think there is in the dull gold or silver bullion stored in a vault in Washington some magic to relieve the infected condition, when these ever-present foci for the dissipation of national wealth, through sheer inability to manage their simplest affairs, have the resources of the country poured out upon them?

The trouble is not in the slick salesman or the crooked politician or the selfish union leader taking advantage of others. The burdens of the businessmen are persons who are so moronic that they take advantage of themselves.

A few days after the above paragraph was written, close to my workshop I chanced to find two priceless examples of the situation we are considering, which epitomize it. One is that of a family which has been on relief for almost three years. Neither of the parents could pass beyond the sixth grade in school. They have received "poor assistance" off and on, even in years of prosperity. Their house is overrun with children, dogs, and filth. But the father was boasting on the street corner that since they had been on relief, they had had a baby born each year, and that he was man enough to keep up his end of the production schedule. "I get \$1.60 a week allowance for each kid," he said, "and I'm no fool." (See note on page 56.)

Somewhat similar in baby-production schedule and lack of general ability is a family living near the first. This family decided that, if they raised vegetables, they would have some of their relief funds available to buy phonograph records. So early in August they planted potatoes, although they lived in a locality where there are killing frosts in September. They will not even get blossoms on their potatoes. This absence of reasoning is typical of the moronic people who are loading an increasing burden upon their clear-thinking and thrifty neighbors.

While the overproduction of children by families, or even by unmarried individuals, in the below-par classes has always been with us, Professor Brossard of the University of Pennsylvania reports that in 1934 the birth rate among families on relief was approximately 60 per cent higher than among families of similar social rank who were *not* on relief. The figures showing this relief-encouraged increase are gathered from widely scattered sections of the country, giving a fair picture of the situation as it has crept upon us in the United States.

Selling methods and working methods have to be adjusted to the nationality as well as to the geographical location of the groups we are working with, for variations in general ability are even more marked between one national group and another, in the United States, than they are between one state and another. We must always remember, of course, that there is a range of general ability within these groups, that there are some who rate high and some who rate low. But we are dealing with the way in which the different persons add up together and come out in the average. We plan for the average person of these groups, the one who is likely to come to the counter in our stores, answer the doorbell, or come to our employment offices looking for a job.

This, we discover, is the way the various groups within the country line up in general ability. The following are above the average of the country: the English highest, the Scotch next, the Dutch from Holland next, and then the Germans. Below the average of the country, we find the Danes only slightly below, the Swedes a bit farther down, followed by Norwegians, Belgians, Irish, Austrians, Turks, Greeks, Russians, Italians, and Polish, in the order listed. The Negroes average a little below all the other groups.

Back in their own countries the situation may be different. The Russians in Russia may be better in general ability than the average of all the whites in this country. It would not be fair to say that the above lists represent the native lands of these peoples. The listing given, however, does show what we are up against in this country: how selling to the Dutch around Holland, Michigan, is likely to be different from the same sales job among the New Haven Italians; how getting toolmakers is easier in German Cincinnati than in Polish Buffalo.

Some of the "smart business" of a generation ago thus comes home to roost—and to haunt. The wealthy New England mill owner who imported cheap immigrant help to compete in the export market left his descendants a pros-

perous mill, which is now falling brick from brick. He also left a source of dilution of the national level of ability, and this helps to make the nation's troubles more than a simple matter of economics, of supply and demand, or of currency fluctuations.

Thus the earlier generations of businessmen have left a burden on the doorstep of today's businessman. Let us see how this burden can be measured.

General ability is measured, not in inches or pounds, but in mental ages. The more general ability, the higher the mental age; and no matter how old a person becomes, the mental age never grows above nineteen years. Nineteen is the ceiling for measuring mental age. Mental age and our birthday ages are two very different things.

These simple little test items may sound amusing, but they should be taken seriously. And they should be trusted when a full and adequate series is given by a competent psychologist. People often ask if such tests are accurate. The answer is that they are as accurate as the room thermometer that you buy for a quarter at the cut-rate drug-store. The tests are not so accurate as the clinical thermometer that your physician uses, but can be trusted as safely as the cheap thermometer you depend upon when you brag about the good weather in your end of town. And even that amount of accuracy in tests of general and other abilities means that we should give deep consideration to the results revealed by such tests.

Here are some specimen tests which persons should be able to pass for each mental age:

Mental Age of Nine Years.—Make a sensible sentence using these three words: "boy," "ball," "river." Morons cannot do this. Approximately 10 per cent of the persons working in a large factory, especially at the lower jobs, cannot make up such a sentence; cannot name the twelve months of the year; and do not know the full date, including

year, month, and day of the week. Half of those on the dole do not have enough general ability to do these things.

Mental Age of Ten Years.—Tell us what is foolish about this: “There was a railroad accident yesterday, but it was not very serious. Only forty-eight people were killed.” High-grade morons cannot detect the absurdity in that statement and similar ones; they cannot copy a simple design from memory, remember little out of the simple things they read, cannot name sixty different words in three minutes, and cannot call back to us a sentence of twenty-two syllables that has been read to them. Yet they may be the mainstays of the yard crew or the scrubbing gang, and have plenty of general ability for numerous other places in business which we will take up in the following chapter. Accidents are concentrated among those of low general ability.

Mental Age of Twelve Years.—Tell us what there is that is alike in these things: “wool,” “cotton,” “leather.” The person with dull average general ability can give a satisfactory account of the similarity among these and can define such abstract words as “pity,” “revenge,” and “justice.” He can rearrange these words to make sense, “for the started an we country early at hour.” The person who can do these things, who has this mental age, will find many jobs boring, especially the simpler ones, and will start looking round for another job. He may feel a little uneasy, too, about being on the dole.

Mental Age of Fourteen Years.—Tell us the three main differences between a president and a king. In this great democracy of ours where a citizen can vote early and often, two-thirds of the population cannot pass this test. For such slightly-above-average general ability one should also be able to find out how much seven feet of cloth would cost if a yard is fifteen cents, or what time it would be if the long and short hands of the clock changed places at ten minutes after eight. People of this mental age get through high school without too much trouble, learn most jobs

easily, and can read the newspapers in addition to looking at the pictures and comic strips in them.

And the average man? Well, as I point out in my book "What Makes People Buy," "He cannot figure out whether warships are painted grey because that color is more durable, because it makes them harder to see, because it is cheaper, or because it was Alice Roosevelt's favorite color. So, naturally, it is hard for him to think. Explanations have to be given him in easy stages, with simple diagrams and concrete words. Pictures and simple diagrams—with some red in them—help.

"This average man does not know where the Buick is made. The name for an eight-sided figure is equally blank. And he does not know how many legs a Korean has. When electric washing machines were first introduced, many women simply would not believe that the machine would really work by using electricity in place of good old-fashioned soap and water."

In the next chapter we shall go into business and industry with our tests—tests more complete than those given above. Now let us take our tests to the criminal courts, to the houses of infamy, to the penitentiaries and reformatories, to see what light we can get from these on some of the social problems which beset businessmen and taxpayers. At the juvenile court we find that one out of every three children charged with delinquency is subnormal in general ability, below the ten-year mental age. One out of every four wayward girls is found to be equally deficient. Half of the delinquent boys are below the average in intelligence. (Girls can get along in our world with less brains than boys.) Half of the unmarried mothers are distinctly below average in general ability. In prisons we find that every fourth prisoner is decidedly below the average.

Recall that in the same department some workers turn out twice the output of others who have had equal training and are using the same equipment. The way in which marked differences in brains show up in what appears to be an equal group of ordinary folk is uncanny. What is one to do about it? Two actual cases will answer this better than any arguments can.

Two girls were given intelligence tests for admission to college. Erma ranked high. Louise ranked so low that the committee almost decided not to admit her to the college. At the close of the year's work, it was found that Erma had been doing work so poor that she was barely passed. Louise used what intelligence she had to the greatest advantage and ranked among the highest of the class in scholarship.

The point is obvious. One's natural equipment of brains is not the only important thing. How one uses his supply is almost as important. The person who, through good luck, has parents above the average in intelligence and inherits a good mentality has nothing to be elated over. He should rejoice but should not let his family heirlooms get the best of him. It is not to his own credit that he has the brains.

His responsibility comes in using this gift of heredity to its fullest extent; not digging ditches when he could be making a physician's rounds or practicing law, not being an average student when he could lead the class, not being content with an average achievement when he has the possibility of excellence within him. It lies within him to develop his potentialities.

To be up and doing, to act as a sagacious steward over his precious heritage of brains—that is the thing that counts most.

(Since the first printings of the book our friend who was "no fool" has been indicted by the grand jury for deliberately killing his brother by running over him with the brother's automobile.)

CHAPTER 5

HOW MUCH BRAINS FOR THE JOB?

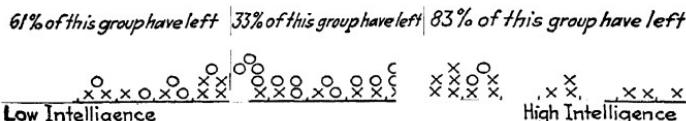
No one has a corner on general ability, although some have much more of this "priceless ingredient" than do others. And that does not necessarily imply that the one blessed with the greater intelligence is any better off; often-times quite the contrary, in fact. For practically every job there is a minimum requirement of intelligence on the part of the workers; if the employer has men with insufficient intelligence on the job, it is bad for him; learning is slow, quality and quantity almost invariably are affected, and there is no one in the group who can be developed for the next job higher-up.

Take the converse, illustrated by the local manager of a telephone company who congratulated himself upon making contacts with the local high schools so that all his operators would be high-school graduates. "No more wrong numbers," he probably thought. The girl graduates did learn the switchboard job in unusually short time; that was a good cost saving. But they did not stay; high turnover more than offset low training cost. Working conditions were without blame, but he had the misfortune to secure a group of new workers with intelligence too high to make them feel interest or enthusiasm in their job after it was no longer new.

In concentrating upon high-school graduates he was indirectly using a very effective intelligence test. Some general information, of course, is picked up in high school, in spite of the students attempts to resist it, but for the average employer the crucial fact is that a high-school diploma is a certification of a certain amount of intelligence that is much above the average. The intelligence has made

it possible to absorb the education; the education has not created intelligence. As Dr. Albert Edward Wiggam summarizes it: "The intelligent person does not need education, and the educated person does not need intelligence."

This chapter is about industry and not education, but it should be of general interest in passing to know that only a very small percentage of student difficulty in high school,



Clerical workers can have too much as well as too little general mental ability. Each circle represents an office worker who held the job for at least two and one-half years. The x's mark those who left before. Those of so-called average intelligence do best and stay longest at this work. For each occupation there is an optimum middle range of intelligence in which the best and longest staying workers will be found concentrated.

or other schools for that matter, is due to poor handling by teachers or to lack of interest. The father troubled about a son who is doing poorly in high school should not pin too much faith upon the benefits of changing to a private school or of urging the school board to get new teachers who will inspire interest. It may be more natural for a father to look upon the schools as being weak; but an employer should accept no explanations at all, if the amount of education received in our public systems is being used as an index of intelligence. This may do some individual injustice, but by and large it is the only safe industrial course to follow.

Our school systems furnish the most gigantic test of intelligence ever used. In engaging college graduates, as many firms do each June, one is not securing employees of mature judgment or even good general business information, but usually one is engaging employees more intelligent than about 90 per cent of the general population. They have more potentiality for qualifying for positions where ability to use one's head is an asset. College has usually

not given them this; getting through college was passing a four-year intelligence test. An employer's experience with college men is likely to be unfortunate either if he thinks college has given them miraculous powers and unlimited amounts of information, or if he keeps these employees too long at low-grade jobs. In the latter case the college man is likely to do the same as the switchboard operators, and turnover figures will take a jump upward.



What is this thing called intelligence? And what does it have to do with a routine assembly job? Probably more is definitely known now about intelligence than about any other phase of psychology. Much of this progress is due to stimulation from industry. In a way it has been an undesirable development, for it has led to the partial neglect of experimental fact-finding in other phases which will perhaps some day be found to be equally important in industrial organization and administration.

Until ten years ago intelligence was thought to be general; now it is definitely known that there are several *kinds* of intelligence and various *degrees* of each kind.

The Bridgeport toolmaker who applied for work with the Safety Car Heating and Lighting Company at New Haven undoubtedly had a high degree of mechanical intelligence, but his low amount of abstract intelligence was shown when the interviewer asked him if he could read blueprints and produced one for him to read. The machinist adjusted his glasses and slowly pointing with his finger read, "Engineering Department. Do not fold."

Abstract intelligence comprises a sort of general quality which permeates the entire industrial fabric. The department foreman and the operator of his automatic screw machines need about the same mechanical intelligence, but the foreman needs more abstract intelligence. The superintendent needs more abstract intelligence than his foreman and in some industries can get along admirably

with less mechanical intelligence. The day laborer does not need much of any kind of intelligence, but usually he has less than is needed.

In industrial terms, abstract intelligence is that quality or ability which makes it possible for a person to handle the thinking phases of his job, which makes his learning period either short or long, and which governs his ability to adapt himself to changes in competition. It is not the executive with high abstract intelligence who has failed to make changes in response to the trend for buyers to pass the inventory carrying to the manufacturer. The sales clerk in the department store does not have many of these varying situations to meet, and in consequence retail sales clerks as a group have unusually low abstract intelligence, being scarcely above average. Insurance salesmen have somewhat more, bond salesmen still more, and engineering-products salesmen need a high degree of abstract intelligence. In all these varieties of salesmanship, social intelligence is also a requisite, but notice how like the weft of a cloth it is interwoven with the warp of abstract intelligence.

Mere possession of the abstract intelligence which is needed for a particular job should not qualify the worker. His other abilities and interests should also be in line with the requirements of the job. But after technical preparation and previous experience have been favorably passed upon, abstract intelligence should also be considered; if this is too low, one has too dumb a worker; if it is too high, one is breeding dissatisfaction, unless the employee can be closely watched for promotion to work of a supervisory or developmental nature. It was Emerson who said, "that man is idle who could do something else better."

There are on the market a few dozen useful tests of abstract intelligence. There are, besides, some other informal tests which are perhaps more useful in the industrial world. One interested in knowing about the formal

tests should get in touch with Marietta Apparatus Company, Marietta, Ohio; World Book Company, Yonkers, New York; and C. H. Stoelting and Company, 424 North Homan Avenue, Chicago, Illinois. Catalogues and samples can be obtained from these three leading sources.

The formal tests do not measure abstract intelligence directly, but only by its results, as an expanding column of mercury measures temperature indirectly. To assure fairness and completeness, a variety of items have to be included in an intelligence test of this sort. It usually contains some items of general information, such as acquaintance with baseball and movie stars, makes of automobiles, and other everyday knowledge, which the dumb applicant lacks to a surprising extent. Other items test phases of learning capacity, ability to give attention, and imagination. In these paper-and-pencil tests, an attempt is usually made to sample a little of every so-called higher mental process.

Most formal tests depend upon the ability of the applicant to read and write, although the writing test is usually reduced to the minimum. Some tests of great accuracy have been constructed in which the applicant does not need to be able even to read; these are called performance tests.

Ability to follow directions is as important in abstract intelligence as it is in industry. Hence, this is included in most formal tests, after this fashion:

Draw a small circle under the second word in this line and a large circle under the second word having three letters.

General information may be combined with ability to follow directions as in the following:

If lead is heavier than iron write 1492 at the end of this sentence, but if Washington liberated the slaves cross out the number written at the end of the sentence.

Practical judgment is probed by such items as:

Since most railroad accidents occur to the last car of the train, would accidents on railroads be lessened if the last car were left off the train?

Ability to deal with somewhat abstract matters is covered in part by items of numerical progressions, such as:

On the dotted lines write the numbers that would come next—

1	2	3	4	5	6	...	...
2	4	6	8	10	12	...	...
10	11	15	16	20	21	...	...
4	1	5	8	1	9	...	...

Ability to see the meaning in disarranged sentences is usually included along this fashion:

Is the following true? fat women are all
ignition has dual ford the new
wrong do can preachers no

Not all items on a formal test are given equal weight; after experimentation on their relative difficulty, some are eliminated entirely, others are given a value of just one if correctly solved, and others are given a score of as much as five if answered correctly.

A score on a formal intelligence test means little until it is related to the average score of those who have made good on a certain job. Scores on different tests cannot be compared directly, since one test may have a possible range of from 0 to 212, and another a range only from 50 to 150. The scores are usually reduced to a common denominator through easily used tables which indicate the mental-age equivalent for each obtained score. The mental age is determined by the performance of large numbers of children of various ages. This accounts for the apparent childishness in most tests; they have to be of such a nature that children can be used in obtaining standard norms for interpreting them. But this very childishness militates against the use of the tests in industry, causing them to be regarded as either a joke or an insult.

Mental age is usually found for different test items by taking those which 75 per cent of children of a stated age can pass. For instance, if 10 per cent of ten-year-old children pass the item, "fat women all are," 50 per cent

How Much Brains for the Job?

of eleven-year-old children pass it, 77 per cent of twelve-year-old children pass it, and 94 per cent of thirteen-year-old children pass it, obviously this is an item belonging to a mental age of twelve years.

Just at which mental age one ceases growing is still somewhat of a problem. Fifteen years ago, the mental age of fourteen years was taken as the peak. Ten years ago, it was raised on the basis of laboratory evidence to sixteen years. Recent experimental work by Dr. F. M. Teagarden indicates strongly that one may have persistent growth in abstract intelligence to a mental age of about nineteen years. This, of course, does not imply that one does not improve in the use of his mental powers after the age of nineteen, but that brute intelligence itself does not develop greatly after that point. Of course, many never reach the mental age of nineteen although in some cases their bodies may be fifty years old.

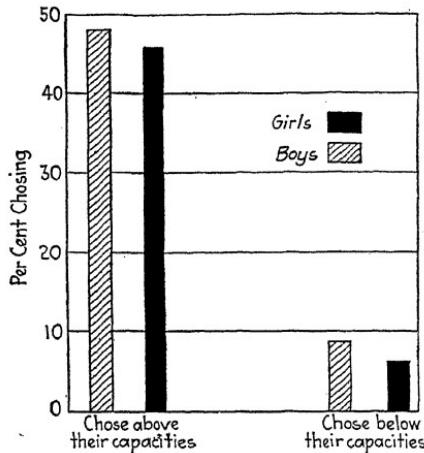
There are a number of informal and fairly trustworthy indications of the amount of abstract intelligence, which can be used to general advantage.

The applicant who finished only the fifth grade in school, for example, should not be credited with a mental age of more than ten years. Some individual injustice may be done by using this school grade as a test; perhaps the applicant really had to leave school and go to work, or perhaps he attended a rural district school with no more than five grades. But in the long run it is well to discount everything but the grade last passed, and in most cases where definite evidence is not offered, it is probably safe to subtract two or three grades from the one the applicant claims.

In case the applicant has finished no more than eight grades, he can be given a credit of a mental age of thirteen at most. He may actually exceed this greatly, especially if he is older than forty years, but the interviewer has to be hard hearted; the industrial career of the indi-

vidual may indicate that it was not dumbness that kept him from going further in school. Such is the case of the president of a midwestern organization doing business in every state, and of the superintendent of a small plant in Syracuse.

The occupation of the relatives and parents of the applicant is another good general guide. Twins are very much alike in abstract intelligence; brothers and sisters



People are too ambitious for their abilities. These charts show how almost half of the high-school students at Hartford, Conn., are inclined to pick a vocation which requires more general mental ability than the student has. Less than 10 per cent are modest in selecting a career which is markedly below their capabilities. (Data from Dr. Gustave A. Feingold.)

are more alike than unrelated children. The applicant whose family is engaged in day labor is not likely to have a mental age much above ten or twelve. How about Abraham Lincoln? Well, his grandfathers were the leading iron-mongers in Pennsylvania and New England. This indicates considerable ancestral intelligence, even though the deprivations of the frontier and the removal of connections with ancestors through Indian massacres might, on the surface, have indicated otherwise. There is the peril of individual injustice again, but it is not a good long-run policy to engage only day laborers and hope that future executive and supervisory talent will be raised from among them.

How Much Brains for the Job?

The intelligence level of the father's occupation should be taken seriously as a rough index of the applicant's probable level. Similarly, the progress of his children through school is relevant.

Previous occupations which the applicant has left or which he did not like also throw an indirect but significant light on his intelligence.

This is the way various occupations rate in the average general ability they demand (some persons with lesser ability get by in them because of special compensating factors, such as low firm standards or marrying the boss's daughter; and some others may have more ability, which means a loss to themselves and the firm):

A mental age of 18.5 years or more for:

Accountant	Editor
Business executive	Lawyer
College teacher	Engineer (mechanical, electrical, civil)

A mental age of 16 to 18.4 years for:

Businessman	Factory superintendent
Buyer	Insurance salesman
Chemist	Journalist
Correspondent	Minor business executive
Dentist	Office manager
Draftsman	Physician
Elementary-school teacher	Private secretary

A mental age of 15 to 15.9 years for:

Bank clerk	Radio operator
Bookkeeper	Railroad clerk
Construction foreman	Shipping clerk
Dictating machine operator	Sign letterer
Factory foreman	Stenographer
File clerk	Stock clerk
Nurse	Traffic clerk
Office clerk	Telegrapher
Photographer	Typist
Postal clerk	Wholesale salesman

A mental age of 13.6 to 15 years for:

Auto assembler	Laundryman
Auto mechanic	Lineman
Barber	Machinist
Bricklayer	Milliner
Butcher	Motorman
Carpenter	Painter
Caterer	Pipefitter
Chauffeur	Plumber
Concrete worker	Policeman
Dressmaker	Printer
Engineman	Riveter
Farmer	Sales clerk
General blacksmith	Stock checker
General mechanic	Teamster
Gunsmith	Telephone operator
Handy man	Vaudeville actor
Horse trainer	Waiter

Lathe hand (production)

A mental age of 11.5 to 13.5 years for:

Canvas worker	Porter
Construction worker	Sailor
Domestic servant	Shoemaker
Factory worker	Sheet metal worker
Fireman (stationary)	Structural steel worker
Leather worker	Textile worker
Lumberman	Watchman
Mason	

A mental age of 10 to 11.4 years for:

Fisherman	Loader
Lifter	Unskilled labor

A more detailed analysis of industrial operations, within a factory employing almost 10,000 men, has recently been reported by Dr. Millicent Pond. The findings, starting with the first occupations, which are at about high average general ability, and arranged in decreasing order so that a little less intelligence is found in each succeeding job, follows:

Salesmen—purveyors—estimators
 Laboratory men—draftsmen—etc.
 Foremen—supervisors—clerks

Electricians
Toolmakers
Machinists and helpers
Rivet die makers—die polishers
Tool grinders
Steamfitters
Packers—shippers
Inspectors, manufacturing—etc.
Toolsetters, not screw and rivet
Automatic screw-machine operators
Light bench workers—etc.
Crane operators—truck drivers
Floormen, buff, butt, etc.
Headers—reheaders
Toolsetters, screw and rivet
Crane trailers—tractor operators
Painters
Heat treat operators
Coremakers—grinders—etc., foundry
Straighteners—saw operators—etc.
Hand edgers—knurlers—etc.
Carpenters
Tinsmiths—ironworkers—blacksmiths
Handscrew machine operators
Oilers—beltmen, rolling-barrel operators
Inspectors, flat metal, etc.
Hand truckers—teamsters
Cutters—trimmers
Heavy presses, manufacturing
Floormen, screw and rivet
Draw bench operators—etc.
Buffers
Fine- and coarse-wire workers
Dippers—platers—lacquerers—etc.
Utility men, stores, sanitary
Stickers—blockers—coilers
Muffle helpers—firemen—etc.
Utility men, casting, etc.
Laborers, yard, construction
Bull block operators—etc.
Extrusion press helpers—etc.

Appraisal of the functions of industry and the general ability they require

The industrial functions

	Accounting	Boiler operating	Clerical service	Designing	General administration	Machine construction	Selling
1. General management					President		
2. Departmental and associate management	Comptroller				Vice-president General manager		
3. Supervision or highly technical service	General auditor						
4. Highly skilled or minor supervision	Auditor			Mechanical engineer			
5. Skilled service	Senior accountant			Executive assistant	Plant superintendent		
6. Semiskilled service	Accountant			Chief designer		Jobbing salesman	
7. Slightly skilled service	Junior accountant			Senior designer	Machinist foreman		
8. Primary service	Bookkeeper	Boiler engineer	Chief clerk	Designer	Machinist 1st clerk		
	Assistant bookkeeper	Assistant boiler engineer	Senior clerk	Assistant designer	Machinist 2d clerk		
		Boiler operator	Clerk A	Junior designer	Bench hand		
		Stoker operator	Clerk B	Draftsman	Machinist helper		
		Ashman	Assistant clerk	Tracer	Laborer		
			Junior clerk	Junior tracer	Shop boy		

How Much Brains for the Job?

How such occupational differences as those shown in general ability work out in a business organization has been mapped by J. O. Hopwood of the Philadelphia Electric Company, as shown in the accompanying chart. The top group, general management, requires very superior general ability. The second group demands at least superior general ability. The third and fourth groups require a minimum of high-average general ability; the seventh, low average or borderline; and the eighth will do very well for the happy little morons that can be inveigled off the dole to go to work.

A junior accountant, of course, may have superior general ability, and if that is the case there is likelihood of his passing up into the higher occupational brackets on the chart. Promotion hinges not only upon length of service and high skill in the present job, but also upon the individuals having the amount of general ability needed in the job indicated in the next higher bracket.



How about those thousands in the population who cannot discover the absurdity of a railroad wreck's not being serious in which forty-eight persons were killed? How about those with low-average general ability—the high-grade morons, and the plain everyday garden variety of moron? Here is a brief schedule of operations they can master and perform creditably, if they are not already busy boondoggling:

Mental age of 7 years.	Painting farm tools, shoe repairing, driving two-horse team, caring for horse barn, helper or horseshoer, drying room in laundry, sweeping and dusting.
Mental age of 8 years....	Packing small articles which are not breakable, stationary engineer's helper, painting flatwork, meatcutter's helper, carpenter's helper, plain hand ironing, kitchen helper.
Mental age of 9 years...	Simple errands, broom making, painting window sashes, whole process of shoe repairing, playing alto and drums in band,

operating jig saw, fancy ironing, plain cooking, waitress in lunch wagon, scullery helper, operating power sewing machine.

Mental age of 10 years...

Printing (setting and sorting type), sewing hat linings, cutting and pasting, mounting articles on cards, folding handkerchiefs, sign painting, greenhouse helper, electrician's or steamfitter's helper, shellacking and varnishing, fancy cooking, work in canning plant.

In some quarters the opinion exists that industry is encouraging those of low intelligence. These comments of amateur industrial observers and professional reformers may need discounting, but they should be taken seriously. My observation has been that the principal difficulty within industry is locating as many workers of "good" intelligence as are needed. I have been in rather close touch, for example, with a Chicago employer of 6,000 men who do not need intelligence greater than that of a ten-year-old child. The pressing difficulty of this employer is obtaining enough men with that degree of intelligence. (This is no reflection on Chicago, as the same situation prevails everywhere.) His prime task has changed from weeding out intelligent applicants to a prestige publicity to encourage more applicants of higher intelligence.

When the Ford Motor Company, a few years ago, abandoned the famous Model T, they ran into a problem which shows that machines at times become secondary to the man. One of their officials said: "It has been men, not machinery, that have delayed us. Work on the new Ford requires more skill in the workman than was the case with the old Model T. All our men have had to be reeducated. This has been a tremendous job, and where human beings are concerned calculations are likely to err. That is one of the chief reasons why we have not been able to meet our production expectations so far."

We shall learn more about this in the last chapter.

Chroniclers of social history make much of the industrial revolution which altered almost overnight the entire industrial life of the white race. Machines were substituted for handwork; dingy, fearful, factory buildings, of the kind we now call old-fashioned, replaced the home; and children worked in these dreary buildings at dangerous machines for unbelievably long hours.

Of course, factory buildings now are not so fearful; machinery is well guarded by safety devices; and children must attend the public schools and not run the risk of losing health, happiness, and morals, as in the days when the factory system was first introduced.

An *agricultural revolution* has taken place almost unnoticed. It is altering the entire fabric of our social life and is responsible for the movement of the population away from the farms (now apparently halted). It is giving political orators much concern. The resultant change makes the farmer into one of the most important figures in our business and political life, and has been driving many families off the farm for reasons of the greatest significance, as we shall shortly find. Abstract intelligence plays an unexpected role in the drama.

My grandparents and great-grandparents, and their ancestors, were principally farmers. Many of my living relatives are farmers, but what different farmers from my grandparents! And what different farmers my grandparents were from their parents!

Therein is epitomized the agricultural revolution which, hand in hand with the industrial revolution, is rebuilding the country and our social life.

Great-grandfather Wheeler and Great-grandfather Carver scarcely sold a thing from their farms. Clothing was made in the farmhouse. Mutton and vegetables were taken to the blacksmith in payment for repairing the plow. Firewood was taken to the little church, and the best products of the field went to the minister.

How to Use Psychology in Business

Some butter, a few dozen eggs, and other products were conveyed to the village from time to time and exchanged for sugar, spices, tobacco, and some silver to pay taxes.

When my grandparents married and settled on the quarter-section, it was a changed agricultural world. The fact that they bought cloth for garments rather than carding, spinning, and weaving the wool they raised is but one reflection of this change.

The population of the United States had increased enormously. More people were living in cities and were in need of the farm products grandfather and grandmother raised. But these cities were often great distances away, and freight and dealer's profits at times left but small sums out of the pay for the farm produce.

As the city population grew, so the demands for farm products increased. In turn, more produce to the acre was required.

The scientist entered farming. State experiment stations discovered ways of increasing farm crops. The teacher entered farming. He took the discoveries of the experiment stations into the state colleges of agriculture, into extension courses, and to county agents.

Together these made the planter and reaper of crops into an engineer! Crop rotation, stock feeding, soil preparation; marketing, financing, complicated machinery, and educational courses have changed the routine farming of two generations ago into work more resembling that of a factory engineer.

The mental demands placed upon the farmer have rapidly increased, and it is only natural that many farmers, through lack of ability, have been unable to keep up with these demands. A century ago, or even twenty-five years back, they could have been successful farmers. What becomes of them now?

The farmer who cannot keep up in the race goes into low-grade industrial work or to relief stations. There his thinking is done for him, and his work is much less complicated and

less taxing on his mind. It is a process of social natural selection, with the intelligence of the remaining farmers increasing each week, due to their ranks' being deserted by those less able to meet the increasing mental demands.

The bright lights, night life, and the glamour of wickedness in the city is not what drew thousands from the farms each year. They have been crowded off the farms by the increasing pressure due to the need of each farmer for the same degree of skill, knowledge, and intelligence as that of a factory superintendent.

Mr. Mencken's description of the farmer as a moron who has manure on his overalls and roasts his Rockford socks beside the kitchen range as he reads the mail-order catalogue may be accurate for some farmers. But it certainly does not describe the modern farmer as I know him, and I gain increasing admiration for those who remain as week after week new batches are forced off the farms into the city.

Look again at the pictures on page 48.



A first survey of intelligence in our world in general and in industry in particular may give a pessimistic slant as to the apparent hopelessness of bettering oneself by improving this valuable ingredient. Here, apparently, is fatalism incarnate. But as Sir Arthur Keith has recently pointed out, the average man uses scarcely one-half of his brain power. The central question may be as to how much abstract intelligence this man uses habitually, not how much he possesses which he might use if he cared to. The amount he uses indicates his *effective* intelligence; the amount he has indicates his *actual* intelligence. The real measure of the man should be his effective intelligence. The problem for the employer of college men is to get them to use their intelligence. That is the problem in the case of many a man. But he cannot use more than he has. The limitations set by his actual intelligence should be thoroughly understood and not overshot. When it is

overshot, I like to call it, in good barnyard English, *strained* intelligence.

Actual abstract intelligence should always be considered in questions of placement and promotion, in picking an occupation for oneself or one's children; but it should not become a shrine or a *sine qua non*. The general manager of one of the largest plants in the Midwest, for instance, some half dozen years ago became enamored of placing workers exactly according to their abstract intelligence. The management played with the idea, began using formal tests, and had been adhering to very strict requirements for some two years when they called in a psychologist. Theoretically their scheme was beautiful, but it did not seem to be working right. It took less than a week for the psychologist to discover that the upper strata of the organization had become so oversold on abstract intelligence that discretion and judgment had literally been thrown to the winds. Previous experience, trade training, mechanical intelligence were all overshadowed in their estimation by general ability. If machinists were needed for tomorrow, the first of today's applicants who met the requirements in abstract intelligence were chosen, regardless of their mechanical intelligence.

Never make a fetish or a cure-all of general ability, but do give it the closest scrutiny and consideration. It is a dynamic factor in all job adjustment, especially in the upper strata of industry. It is just another tool for use in aiding judgment in administration and organization. When sanely used in guiding organizing judgment, it has been most useful; but that is no reason for thinking it can supplant judgment.

These are some of the neglected psychological factors which make reconstruction a difficult task—and a different task possibly than has been conceived by those who have taken the reins into their hands. Our economic life and our external civilization have become so complicated that

mastering them, or even getting along so that both ends can meet, is beyond the ken of great portions of the population.

National affairs may have run more smoothly in the early days of the republic, but not because the problems then, when a new nation was being shoved off into a hostile world, were any simpler than today's problems. The truth is, I suspect, that starting from scratch and without precedent to refer to, those who "guided the destinies of the United States in its first few decades were faced by more difficult problems than have since been met on a similar scale.

That the early leaders succeeded so well does not mean that Patrick Henry, Daniel Webster, Henry Clay and the rest were any better equipped for their work in general ability or special qualities, than our leaders of the present generation have been. They had the advantage, now lost, of the guiding support—or, at times, recall—by a body politic which undoubtedly exceeded the modern average in general ability.

The average voter at the time of the War of 1812 probably had a greater degree of personal ability to be used in reaching decisions, and this helped to guide the political leaders. And shrewdly this level was kept high by restricting the ballot to those among the citizenry who had given objective evidence of being able to care for themselves.

Today we are faced with tremendous problems incident to trying to run industry and government successfully in a democracy which has seen its average general ability gradually diluted through successive generations. The public schools and the relief lists and the browbeating of those with general ability, which have been our mainstays, obviously will prove fruitless as means of solving the problems which continue to face us. The restricted electorate of more than a century ago may be worth reviewing as pointing the way to a basic and sound approach. True, those were horse-and-buggy days, but they were days when

a young nation, with enemies in every direction and at every distance, charted a course which was eminently successful so long as both the course and the electorate were understanding.

In the light of all these facts about weaknesses in the general ability of human beings, ponder the following instance—typical probably of at least one-fourth of those for whom our social order is being turned topsy-turvy—reported in the September, 1935, issue of *Mental Hygiene News*, of the New York State Department of Mental Hygiene:

Several months ago an Emergency Relief Bureau investigator, a young man about twenty-five years old, entered the office of a mental hygiene clinic psychiatrist with the remark, "I didn't want to bring this woman up here today, but my supervisor told me to." The psychiatrist in some surprise asked the investigator his reasons for thinking that the psychiatric examination was unnecessary, and was told that the investigator did not believe in case work but thought applicants should merely be given relief when they asked for it, as "there is too much investigating to do anyway."

The particular client who had brought about this expression of opinion was a slovenly woman about thirty years old, who was not able to keep any job or use her money wisely, and was thought to be sexually promiscuous. When the psychiatrist talked with her she was very friendly and loquacious, although she was unable to tell the name of the friend with whom she lived, other than "Dot," and explained that she had lost her last job, waiting on table in a restaurant, because her girl friend had got the job for her and "when she left I had to go too." On a mental test her mental age was less than eight years, which placed her definitely in the feeble-minded group. Since, in addition to this formal test rating, she was so inadequate along social and economic lines, it was recommended that she be sent to a State school for care and supervision.

In this case emergency relief would have been futile, as this woman, both according to her history and the psychiatric examination, will probably never be able to support herself and manage her affairs without help, and has shown no promise of being an asset to the community.

If, as seems likely at present, the relief bureaus are to become a more or less permanent part of our social organization, it is to be hoped that

their directors can impress upon the investigators the value of obtaining as much information as possible about their clients before deciding upon the type of care to give them. Such a policy not only insures the wisest use of available funds but, more essentially, provides for each client the individual treatment which is necessary for his future economic adjustment and good mental health.

CHAPTER 6

HOW INTERESTS CAN HELP BRAINS

We have all heard some sour-faced person say: "I wouldn't have his money—there's enough to worry about, as it is!"

Our suspicion that he is saying this just to make an impression is proved the following day when he asks his boss for a raise. There is an important psychological truth, however, behind his comment.

This truth is that money is not all that men work for. A practical administration on this basis by the executive makes the difference between success and failure in building a loyal, dividend-paying, successfully happy group of employees.

The best pay men can receive is not United States greenbacks; they are soon spent, and even the memory of them and the things they bought is fleeting.

Labor leaders and college economists have lately found that cash wages and real wages are different. Cash wages have increased rapidly since days before the war, but because of the shrinkage of the buying power of the dollar, real wages have not had the same increase. The important thing is, not how much money is in the envelope; it is how much that money will buy.

But how about the mental wages the job pays? These are not put into the envelope. They are paid, if at all, not on Saturday noon but every minute the worker is at his work.

The mental wage is low if the employee is not interested in his work. When he is in work adapted to him and which he likes, then his mental wage picks up. Some workers can

be found who will be interested in a job others dislike. They are worth finding, for no matter how low the cash wage, the worker will be overpaid unless he is interested. Before blaming the worker for lack of interest it often pays dividends to ask, "What can we do to make work more interesting?"

You will be astonished to find how high a wage garbage collectors receive. That is because their mental wage is low, and a relatively high wage has to be paid in cash to keep them on the job. Compare this with the money wage of a bank clerk whose mental wage is high. As a job picks up in "class" and social prestige, its mental wage improves, and oftentimes the actual cash wage is lowered. Plants and offices near vice districts pay a low mental wage. Yet most books on factory location do not mention this.

Official Germany has long recognized the prestige factor in mental wages by giving petty officers titles which are outsplendored in grandeur only by the uniforms.

Mental wages pick up when the workers are given some responsibility and chance to show initiative. Safety committees, entertainment promotion, and similar activities in which the employees help to take the steering wheel supplement the pay envelope with man's most satisfying wage.

In each conversation with the employee, the foreman or supervisor can add to the amount of the mental wage. When a worker is sent to a new task by, "I wish you'd *take charge* of this," he is being paid a higher mental wage than when he is told, "Hurry up and get it done." His responsibility is recognized when he is asked to take charge of the detail.



"This is the sixth raise I have had in 18 months," a former student wrote me. "They must be satisfied with my work but I wish to gosh they'd *tell* me what they think of me." His cash wage had grown steadily, his mental wage had as steadily declined because of the suspense. Some

executives use suspense in handling workers, but it eats into both morale and dividends.

There are some companies which find a high cash wage profitable. Others find it too expensive to continue. This is usually because the employer who finds that this pays has been paying good mental wages along with his weekly checks. Money is not the only incentive for workers.

Organized labor must consider this before demanding high wages. Many firms paying a low wage could not pay higher, because their mental wage is so low that all the money in the world could not bring their production up. It is industrial suicide to think that an increase in cash wages will pep up output, when the mental wage is low or missing, as it is in many places.

As soon as the members of a firm start thinking seriously of adopting a differential bonus, group bonus, or some other trick system of payment, the psychologist begins to suspect that they have been paying a low mental wage and are trying to remedy it by adding financial incentives to their pay system. Theoretically these *x-y-z* bonuses are perfect; practically they work in one place and fail in another, because they cannot offset a low mental wage.

Socialism and the piece rate have the same underlying misconception of human nature. Both assume that money is about all that men work for.

If your firm is organized so that the employees are working solely for money, it has been badly bungled in management.

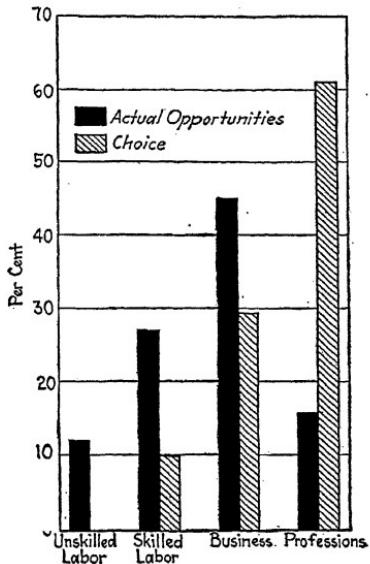
Have you ever figured out what mental wage you are giving them each day?

The mental wage is highest when people are in work which fits their intrinsic interests. H. Gordon Selfridge, the merchant-prince, said: "There is so much more to the employee than two arms and two legs. There is the spirit of enthusiasm and earnestness and 'I will,' which means

more to the employer than ten pairs of arms and legs. And loyalty is a quality to be earned by the employer from the employee and only earned by fair, friendly, generous treatment."

And William Green has said: "Back of all the collective skill, strength, and power of all the working people of our Nation are the soul and mind which give inspiration and impetus to all their physical powers. These unseen forces must be given an opportunity to function in concert with the strength and brawn of labor."

Real interests should be distinguished from romantic glamour. There are many occupations, such as those of explorer and novelist, which attract through sheer glamour, but in which one would not be interested otherwise. It is an



Mental wages have to be given special attention, for many persons have to go into work which was their second, or third, choice, as these data

some enticing pursuit such as exploring, but having one's picture in the Sunday supplements should not be confused with interest in the details of life which have made possible the accomplishment.

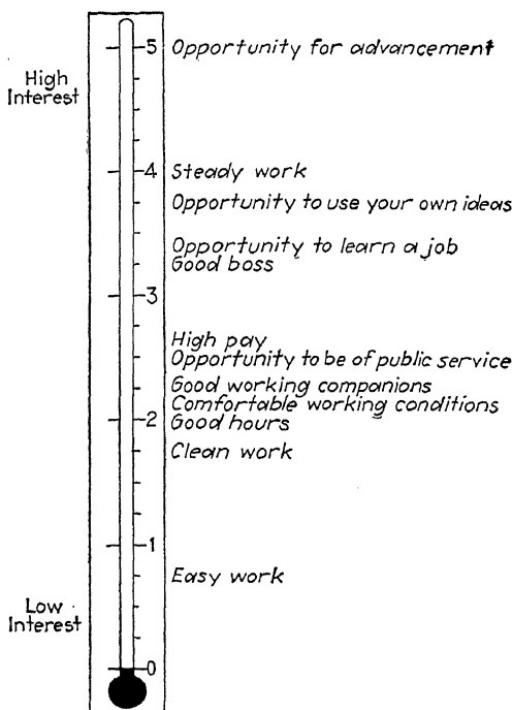
cent of them have to be content with something else. Obviously, many who are complaining about their wages are really discontented because they could not go into the work that interested them.

There are several methods which have been successfully used to test the interests of people. A useful common-sense inventory of the applicant's interests can usually be made during the personal interview. The interests should be noted by detail rather than by occupation. For instance, the occupation of machinist may involve fine attention to

How to Use Psychology in Business

small details, or coarse work. The important factor is not the occupation of machinist but liking fine or coarse work.

A useful check list to use is shown in the illustration. It can be expanded for the special requirements of indi-



Thermometer of job interest. Based on the study of 100 department-store employees. The distance which separates the phrases shows their relative importance in making the job interesting. (*From the work of S. N. F. Chant, Personnel Journal, 1932-1933, Vol. 11, p. 1-4.*)

vidual companies. "Interest Specifications" can likewise be made for each occupation within the plant.

A few applicants during the interview will maintain that they like every kind of work and working condition. If the interview is handled skillfully in a conversational manner, this pitfall can usually be avoided. A column headed "month's experience" can be used for giving a check upon

Do the work and the worker's interests fit?

Check here if the man has the interest	Check here if the work requires the interest	Working alone; isolated from others.
		Working with others, as on a crew.
		Working alone, but with others around.
		Painstaking, accurate work.
		Heavy work requiring exertion.
		Work indoors.
		Work both indoors and outdoors.
		Outdoor work.
		Writing required, as reports, letters.
		Quickly finished.
		Work progresses slowly.
		Work changes from day to day.
		Work pretty uniform from day to day.
		Worker does the planning.
		Someone else responsible for planning.
		Work mostly in one place.
		Chance to move around considerable.
		Work mostly with machinery.
		Work mostly with people.
		Considerable calculating and figuring.
		Handling other people.
		Making pretty or artistic things.
		Risky, taking nerve at times.
		Both sexes working together.
		Own boss.
		Persuading others.
		Making mechanical things.
		Cleanliness.
		Bargaining.
		Handling money.
		Little physical activity.
		Social activity.
		Irregular hours.
		Animals.
		Flowers, vegetables, plants.
		Travel.
		Meeting people.
		Dressing up.

the likes of the applicants who state that all the features outlined are liked.

There are a few individuals bordering on the abnormal who can be interested in nothing, who like nothing. There are a few others who are fascinated with anything they happen to be doing; this is especially true of young people who have not "found themselves."

It is an unreliable test merely to ask an applicant how he liked his work as assembler. If the morale of the entire plant was low, he may in fairness say he did not like the work. But when the important details of the work are inventoried for his interest in them, the picture is changed.

Interests in total occupations may change from time to time, especially with those under thirty, but detailed interests do not change so markedly. The reason for these changes is open to conjecture. It would not be surprising if they were due in part to failures to build plant morale.

It has also been experimentally shown that in general the employee does his best work while engaged in doing what he likes. But the correspondence between liking to do a thing and ability to do it is not always found. Aside from the question of interest indicating ability, the most important fact is that morale is higher if the worker likes his work. This question of morale should be one of the primary considerations in finding the job.

The real interests of an individual take root from his inner emotional life, and often are revealed only indirectly or to the especially trained observer. The average person usually calls this "personality." Personality is an index of the difficulties that one meets in adjusting his emotional life to his environment and the success or failure of this adaptation.

The world has changed, but human nature has not. In-born human nature today is the same as it was twenty

centuries ago. There are the same basic desires and tendencies, but the external world has changed so that many of these are now frustrated or must find an indirect expression. Much human striving, restlessness, and unhappiness undoubtedly is founded upon inborn tendencies which have been frustrated.

In the easygoing old days when there was less competition, less hustle, less social stimulation than we live in today, it was undoubtedly easier to live and to express these in-born drives than it is now. In those old-fashioned days, personality maladjustment and loss of interest were conceivably of rare occurrence. Today, it is difficult to discover a person who has not some quirk in his personality due to minor maladjustment. This is one factor which makes thousands of persons lack interest in their work.

How enormous this personality waste is, no one can accurately estimate. At the extreme of fairly complete personality balking we find that approximately one out of every ten adults has a breakdown in personality some time in the course of his life, a breakdown so severe that he has to go to a hospital for mental treatment.

These breakdowns are not caused by germs or poisons but principally by lack of guidance in adjusting inborn human nature to the vicissitudes and cramping of environment. Most of these severe breakdowns are preventable. Most lack of interest in work, too, can be prevented.

Psychological and medical specialists are already actively at work in centers throughout the United States in guiding and studying the problems of personality adjustment in individual children so that these severe quirks may be prevented. Still others are engaged in helping the adult redirect his drives, so that the lack of guidance during developing adolescence may be corrected. So, although personality disorders have been increasing at an unprecedented rate in the last two decades, it is likely that as a result of these organized efforts, with each individual gaining more insight into his own personality problems, per-

sonality health rather than personality ill-health will again become a human characteristic.

As conditions in the world stand now, however, specialists find that about 20 per cent of all workers have personality ill-health so marked as to need intensive personalized treatment; this is in addition to the one out of ten who sojourns for a while in a hospital for more serious lack of balance in personality.

Personality ill-health includes more than merely determining whether one is popular or unpopular. Its ramifications extend into practically every feature of human behavior, and the popular person who is widely liked may nevertheless have many unhealthy personality traits. Thus, while symptoms of an imbalanced personality may not keep one from being popular, they do strike at personal efficiency, peace of mind, and ability to "stand the gaff" during a period of special strain.

A practical idea of the range of signs of personality ill-health will be obtained from the accompanying list of questions, in which each one answered "Yes" indicates one element of personality maladjustment. The average adult has about one out of every three of these signs, which are unfavorable for personality health. The thwartings in the world are probably pretty evenly distributed, very few persons getting more than their fair share of them. Why, then, does not everyone have the same personality trouble? Why is it that some individuals seem to build upon these thwartings, while others are nearly wrecked?

The explanation is not heredity in this case, as it is in the case of general ability. In the case of interest, the reason is found in the individual's own personal point of view toward these thwartings. By simple acts of thought they can be made to look like either a mountain or a molehill, either an obstacle or a steppingstone. The application of these points occupies an entire book in my volume "*More Zest for Life.*"

Look upon everyday thwartings as molehills and stepping-stones, and personality health will probably be built up. So-called stamina is usually a calm, take-things-as-they-

*Signs of emotional frustration which causes
loss of interest in the job*

- | Do you sometimes experience pressure in or about the head?
- | Are you uneasy when crossing a high bridge?
- | Do you tire easily?
- | Do you bite your fingernails?
- | Do you have difficulty getting used to new places?
- | Are you touchy on certain subjects?
- | Do things sometimes swim or get misty before your eyes?
- | Do you get rattled easily?
- | Are you slow to be moved to laughter?
- | Are you afraid of dogs?
- | Are you afraid of lightning?
- | Do you lose your temper quickly?
- | Are you discouraged easily?
- | Do you "fidget" and toy with your hands when trying to sit still?
- | Do you say things on the spur of the moment, and then regret it?
- | Are you indifferent to the opposite sex?
- | Does your mind wander so that you lose track of what you are doing?
- | Do your moods change from happy to sad without good reason?
- | Do you get tired of your regular work easily?
- | Do you have trouble forgetting unpleasant experiences?
- | Do you have trouble sleeping?
- | Do unpleasant smells upset you?
- | Are you a "crank" about food?
- | Do you worry over work?
- | Does it sometimes seem that people are reading your thoughts?
- | Are you troubled occasionally by thoughts about death?

(The average adult has one out of every three of these signs that his inner emotional life is such that he will not be interested in the work in which he is engaged, regardless of what that work is.)

come, make-the-best-of-troubles attitude, which can be acquired.

Those who are crippled or diseased undoubtedly experience more thwartings than the average person. Many observers have noted the personality kinks of cripples;

but this does not hold for all cripples, for some have a point of view, an acquired attitude, which builds personality health.

Take Lee Cook, who died recently at Louisville, Kentucky. A hopeless cripple from early childhood, he did not have a chance, but he made one. What he accom-

Qualities of the "good" personality¹

- | Is sympathetic: easily appreciates someone else's difficulties.
- | Shows confidence in bearing and tone.
- | Cheerful and optimistic (continuous).
- | Is very energetic—always doing.
- | Mixes socially with others. Joins clubs, etc. Knows many people.
- | Reads a great deal, studies to improve his information, etc.
- | Clever in repartee, retorting quickly to remarks of others.
- | Fluent in conversation. Varies vocabulary, used easily.
- | Neat and careful about dress.
- | Has hearty laugh, showing relaxation, if not actually boisterous.
- | Is natural, easy listener. Raises questions and is attentive.
- | Has several close and intimate friends; prefers deep friendships.
- | When right, sticks to his point; determined to prove it.
- | Smiles easily and frequently in conversing with others.
- | Quick to make complimentary remarks about others in their presence.
- | Careful not to hurt another's feelings, or create a false impression.
- | Collects jokes and stories; tries them out often.
- | Is fond of "kidding"; enjoys trivial conversation.
- | Is serious in all dealings with others. Every decision important.
- | Naturally talkative, constantly expressing himself even when not invited.

plished from his wheel chair gives material for an epic picturing the stamina of a point of view. We read of him:

"Though deprived of the use of his legs, he was active in business, enjoyed recreation, and traveled widely. Though his hands were stunted in size and power, he made miniature copies of famous paintings. In a more practical field, he invented the metallic packing for marine engines, which was of much use during the war, and with other inventions

¹ From the work of Dr. Edward S. Jones; *Personnel Journal*, 1932-1933, Vol. 11, pp. 86-90.

How Interests Can Help Brains

he arranged to get a full lifting force of every pound of steam.

"He was a patron of young men and among those he encouraged and helped was one who is now president of a New York bank. He was deeply interested in the economic side of public affairs and his place in the manufacturing world was high, both in his own community and elsewhere. He was doing and striving his whole life and succeeded in every chosen line, despite every handicap life could offer him except a dull stunted mind.

"His friends say he managed to accomplish so much because he never permitted his afflictions to depress him, nor suggest to those he met that he felt his lot a piteous one."

One's attitude toward the daily events of life may be more crippling than a distorted and helpless body. Attitude has become of increasing significance in the past few decades, due to the flux and flow of our civilization.

Of the several ways human beings may, so to speak, jump in their attitudes toward the unpleasantness or frustrations of life, there are two interesting and contrasting ways they may go and give a telltale stamp to their personality. These show an amazing kinship between laziness and extreme industriousness. Dr. L. E. Hinsie, of the New York State Psychiatric Institute, has recently summarized these two directions as follows:

Psychiatrists find it useful in their treatment of certain psychiatric disorders to accept the idea that people may be incapacitated because the personality becomes undermined. Ordinarily the uninformed are inclined to look for physical factors in the causation of illnesses; but it is well known that people may become ill because of the way they think, feel and act.

Much work has been done to show that many mental illnesses appear to be exaggerated responses of the personality. For instance, in the majority of those patients classed as dementia praecox, there is a definite history of the so-called "shut-in" type of personality. Long before the

actual mental illness sets in, these individuals are seclusive and relatively uncommunicative. They fail to mix freely with others. They are day-dreamers, dreaming of what they cannot accomplish through actual effort. This shut-in type of individual may eventually give up all contacts with people and with outside circumstances and fall back upon a dreamy type of existence. When this state is accompanied by delusions, the patient is regarded by most persons as mentally ill. The illness, however, is an exaggerated expression of his former personality.

Mental hygiene recognizes that these shut-in individuals may not only lead an unproductive life but that they may become mentally ill. It is advisable, therefore, to recognize shut-in persons in their youth, if possible, in order to develop their interest in everyday activities. They should be taught to mix with some degree of freedom with other people and to be more practical in their everyday life.

Other individuals may show exaggerated personality tendencies in another way, such as persons who are always busy. They fill all of their waking hours with incessant application to work. They may be described as having a "Sunday or holiday neurosis"; that is, they find it impossible to be free and relaxed even on such days. Their time is always loaded with matters pertaining to their special careers. They do not appear at ease in ordinary social gatherings, although they are leaders and have a great deal of initiative. Indeed, their difficulties revolve around the fact that they are too industrious. They are certain that they will be brilliant successes, and will not permit anything to interfere with their allegedly constructive program. They tend to leave people out of their lives, except insofar as those people may be useful in furthering their careers.

This same type of person may show marked fluctuations in activity from time to time. He may for months have an incessant drive for recognition, while at some other time he may go on for months with a feeling of hopelessness, insecurity and a heightened feeling of inferiority. In the first instance he is over-industrious and optimistic, while in the second he is less productive and inclined to be pessimistic. This type of individual may meet a situation which he cannot conquer, and when such a problem arises it is quite probable that the original personality tendencies may become grossly exaggerated, so that they develop into a morbid psychiatric syndrome. It is advisable to identify such individuals early in their careers, so that they may be given to understand their unstable reactions and too one-sided development. Many of them may be taught that they can have successful careers without sacrificing normal social contacts.

Again, many psychoneurotic conditions may be identified in youth or early adolescence. There are persons who are afraid in certain situa-

tions, such as in open or closed or high places. There are some individuals who are inordinately fussy, and who carry their demands for precision to such an extent that it interferes with ordinary practical activities.

These types of personality response are ordinarily amenable to modification, which amounts in many instances to habit training along natural lines. When the problem is very severe, it becomes advisable to treat these patients by more formal methods of approach, namely by one or more of the recognized forms of psychotherapy administered by an experienced and well-qualified psychiatrist.

Flexibility in the individual's interests is imperative now. Too many are still thinking horse, although riding in high-powered cars. We become like the bear which had for ten years paced back and forth in the cramped confines of a circus wagon. When moved to the zoological gardens, where he had a half acre to walk in, he still paced back and forth in a ten-foot space.

William B. Stout, outstanding designer of airplanes, emphasizes this when he comments: "Now, in one year of time, more facts are discovered and put to work than during the entire lifetime of your father and mine. This means that in one year of your life today, if you would be successful, you must do more thinking than your father had to do in his whole lifetime, and more thinking than his ancestors had to do in centuries.

"It means that if you believe a year from today what you believe today, the world has outdistanced you."

Such was not the attitude of those ministers who preached against the first steam locomotive as an agent of the devil, or of the venerable lady, brought up in a city of horse cars, who complained after the electric trolley was introduced that she could feel the electricity in her spine when she rode in a trolley car. This may be the outmoded attitude of many with no interest in their work.

It is probable that invention and commerce will make more changes in the world in the next ten years than they

have in the last twenty-five. It is also probable that in consequence the stress and strain on personalities will increase proportionately. This will not affect a fortunate few who have the stamina, but it is likely to affect adversely hundreds of thousands, as hundreds of thousands have already been affected.

This is the first chapter in which the "Test Yourself" rating forms appear. The author asks the reader to keep a record of the scores made on each test and to mail them to the author at Hamilton, N.Y., together with the page numbers of the tests. The scores made will be of use in the further accumulation of data on applied psychology. Age, sex, and occupation are also important items that should be supplied with the scores.

CHAPTER 7

LAZY PEOPLE AND INTERESTS

“When Zest departs,” says Owen D. Young, “labor becomes drudgery. When exhaustion enters, labor becomes slavery. Zest is partly a matter of physical condition, but it is also largely influenced by mental factors.”

“He is so lazy that he hates to breathe,” is a phrase used by midwestern farmers to describe their lazy farm hands, and it is sometimes extended to their own sons. Indolent boys and girls are a cause of considerable worry to parents the world over, and have been for generations.

Gioacchino Rossini, the celebrated Italian composer, was so lazy as a boy that his father made him work the bellows for the blacksmith and invited his playmates to jeer him. Montaigne, the French essayist, was “lazy and languorous” at seventeen. The English novelist Harriet Martineau was “indolent in body,” as her discreet critics phrased it. Another English novelist, William Makepeace Thackeray, was called an “idle boy” by his teachers, and “very lazy” by his schoolfellows. Justus Liebig, the famous German chemist, was so lazy that he kept faithfully at the foot of his school classes, in spite of the fact that his intelligence quotient is said by Stanford University psychologists to have been as high as 165, in contrast to the average intelligence quotient of a mere hundred. But perhaps such geniuses can afford to be indolent.

Amazing are the reports of the prevalence of laziness among ordinary children of the present day. One out of every eight children in forty-two classes studied in Moscow schools by P. P. Blonsky, as recently as the year 1929, were found to be lazy—more than 10 per cent of the school children, lazy. As the reader might suspect, the vast major-

ity of lazy children denied that they were lazy; 80 per cent of the lazy ones, in fact, denied that they were indolent idlers, despite overwhelming evidence to the contrary.

It is probably another instance of like father, like child, in this regard. The grown-up and lazy loafer is not lazy, in his own opinion; he is merely "thoughtful" or "does not believe in rushing into things half-cocked." Of undoubtedly lazy children 80 per cent maintain that they are misjudged, and if a house-to-house canvass were made of adult loafers and dole seekers we should probably find about the same percentage of denials of the charge of laziness. In other words, 80 per cent of us may be genuinely lazy and not know it, just as many fellows who insist on relating allegedly humorous incidents to entertain others are in cold fact bores rather than entertainers.

The school children studied by Dr. Blonsky made another strange revelation, one that may cause much family discussion as well as throw light on why industry has found so many places for women. Of all the girls there were only 4 per cent unequivocally lazy, but exactly 19.3 per cent of the boys were discovered in this category of the undeniably lazy. Think of it—more than four times as many lazy boys as girls, in fact, almost five times as many lazy boys! Can this be true?

Well, when we look into the outstanding problems of a thousand grown persons, equally divided between men and women of the average sort, selected neither for their genius nor for their particular dumbness, we find confirmation in the fact that more men than women have a tendency to laziness as their inclination most difficult to overcome. The exact figures show that 14 per cent of men and 9 per cent of women have this human fault developed to an acute point.

So the "weaker sex" may not be as weak as men have alleged.

Plainly, women are not as lazy as men, whether the women are still little girls in short dresses, or women in full bloom and shorts. This is all the more astonishing when we discover that the study of the same thousand men and women showed that while only 11 per cent of the men needed energy for doing more, there were 15 per cent of the women with this as their greatest need.



Works Doctor—There's nothing the matter with you but laziness.

Tired Hand—Wot's the Latin fer that, sir, please, so's I can tell the foreman?

—*London Opinion*

When the energy of women is measured by their metabolism, it is found that they are about 15 per cent below men in this measure of energy available. This fact, coupled with the observation that, besides, periodically women have unusual physiological depletions of their energy, reflects but scant credit upon their masculine fellow beings whose indolence exceeds theirs. Here we find that women have more actual physiological justification for being lazy, but paradoxically it is the opposite sex that excels in laziness.

Everyday observations confirm the scientific findings as to which is the lazier sex. Laziness makes the automobile popular, many persons being frankly too lazy to walk. And every family knows who gets the most use of the automobile; to escape walking. Then, too, the husband buys a power drill for his home workshop before a family electric

dishwasher is purchased. These are cited not as a cause for family arguments, but as common experiences, which anyone can multiply by his own observations, to illustrate the point.



Being tired and being lazy are very different things, although it is easy to confuse laziness and fatigue. Later, we take up fatigue itself. Women may become fatigued more quickly than men, although they are less lazy. Medical examinations of the indolent children in the Moscow schools, for instance, revealed no illness or other medical reasons to account for their laziness.

True laziness, such as we are discussing, is mental and not physical. It is caused by ideas and emotions, not by work or poor physical condition. The lesser laziness of women in spite of their lesser energy available shows that it is a mental factor which underlies laziness. Tramps are not sickly weaklings; they are usually strong hulks of men with mental attitudes that make them shun exertion.

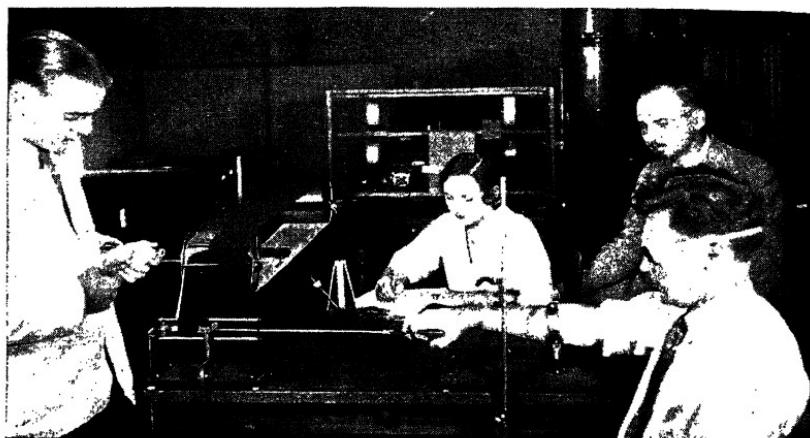
Then consider the hard application to work, against the obstacles of physical fatigue and of actual illness, illustrated in the lives of many outstanding personages. Charles Darwin's body was always racked by weakness and illness; all the vast amount of creative scientific work done by this famous English naturalist was accomplished only at the price of great effort against his physical frailty. The great German philosopher, Immanuel Kant, labored consistently against similar genuine physical fatigue and weakness. Always frail and with his health giving way when he was thirty, Friedrich von Schiller was still an indefatigable worker, often laboring for fourteen hours a day on taxing creative work. He worked when he should have been resting in bed. His total lack of laziness, when he had every bodily excuse in the world for being lazy, is generally considered an important reason for his almost complete loss of health while still a young man, and the same heroic

Some earmarks of a lazy make-up

	<i>Yes</i>	<i>No</i>
Do you rely on your own judgment instead of that of others as to embarking on new enterprises, jobs, etc.?.....		
Do you promptly accept responsibility?.....		
When responsible jobs are not offered to you, do you go after them?.....		
Can you discuss fairly and frankly your own character and abilities?.....		
When contradicted do you stand up for your own views or versions of past events?.....		
Does modesty, fear, or deference prevent you from expressing your honest opinions?.....		
Do you welcome the opportunity to meet new people?....		
Do you "blow up" and abuse others when you lose in games of chance?.....		
Do you start things yourself, rather than waiting for someone else to suggest them or tell you?.....		
Do you insist upon results, not permitting yourself to make excuses to yourself?.....		
Do you go ahead and complete distasteful tasks?.....		
Can you work in the presence of others without being rattled?.....		
After you have made a decision, can you put the matter aside without worry?.....		
Do you like to tackle knotty problems?.....		
Can you profit by the opinions of others without being unduly influenced by them?.....		

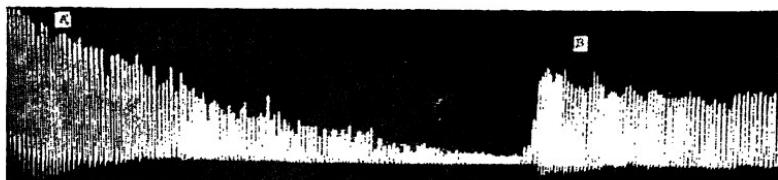
Each question answered "No" suggests the presence of laziness as shown by undermining initiative. The average business or professional man answers six of the questions "No." Some of the questions are obviously more pertinent in revealing laziness than are others.

attitude was responsible for his too-early departure from this life.



A curve of work is written on the smoked paper on the left by the pointer attached to the string which the blindfolded subject pulls with his middle finger. A ten-pound weight is on the end of the string. The gradual shortening of the lines on the smoked paper show fatigue of the finger muscles.

An astonishing psychological experiment; which has been repeated many times, shows dramatically how potent the nervous system is in causing laziness. A person is made to lift a weight with a finger, time after time to the rhythm of a metronome, until he cannot move the finger a single time more. "My finger is tired out," the subject says. "The work



This smoked paper record of finger fatigue shows, on the left, how the subject's finger became fatigued. Then he was hypnotized and told he was not fatigued. Observe at B how his finger immediately lost its "laziness" after this hypnotic suggestion.

has fatigued my muscles." But the weight lifting has not fatigued the muscles of the finger, as the next phase of the

demonstration experiment shows when a mild electric current is applied to the finger muscle to take the place of the nerve currents, and, lo!—the finger contracts, showing plainly that the muscle was not fatigued but that it was the “little gray engine,” the mental machinery, that became tired of the exertion and gave up the job. The muscle was not tired, the mental powers and the nervous system through which they work simply grew lazy in the task of lifting weights, just as they grow lazy in many efforts more important. Women’s muscles may tire more quickly than men’s, but the findings previously discussed show that their mental machinery does not so easily give up and make them lazy.

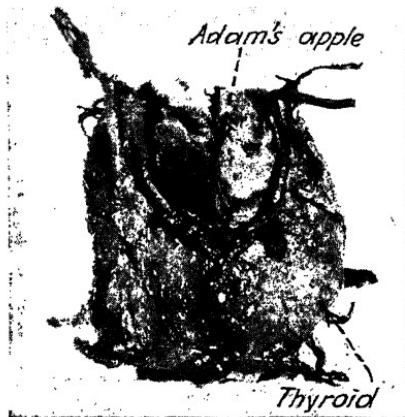
There is, of course, such a thing as being really tired and not simply lazy. The last part of the book is devoted to the elimination of tiredness.

Not to be confused with tiredness is the sluggishness, lack of pep, general inertia found in some persons through their adult years; and in most persons during adolescence, those years from fourteen to sixteen when they bloom into full manhood and womanhood. This sluggishness is due to changes in the activity of the ductless, or endocrine, glands. During the glandular maturing in adolescence, which is so painful for parents, there is a temporary disturbance of the balance between the different ductless glands, as the internal secretions of the sex glands come into ascendance in the life of the individual.

In contrast with young people, however, adults who are sluggish and lacking in pep are often so because the thyroid gland, just below the Adam’s apple, functions slightly below par. If this is the case, the skin is usually colorless, the hair sparse, and the whites of the eyes dull.

Some others, who are brimming with energy in their twenties, have their thyroid glands to thank—and to watch. It is important for these persons to keep watch of the

thyroid gland, since their pep—especially if their eyes are glistening, hair luxuriant, skin warm—indicates that the gland is working overtime, and in due course of events it may have done all the work it can by the time the middle thirties have been reached. This is the explanation physiological psychology gives for those persons who start life



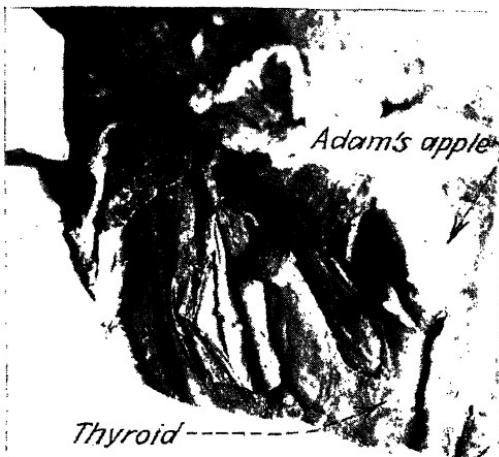
This well-developed thyroid gland astride the windpipe can be identified by the U shape and the bridge connecting the two lobes just below the bulge of the Adam's apple. Its possessor was doubtless energetic, perhaps even vivacious. (*From the author's laboratory; an unretouched photograph. Copyright 1935, D. A. Laird.*)

radiating energy and activity, but who slow up a decade or two before the customary slowing-up time.

It is not the hardships of matrimony or of industry that cause such persons to slow up. Their glands simply made them live too fast for a decade, and the slowing up amounts almost to a burning out. But those with thyroid glands sluggish from the start do not have this worry, for their fires are not stoked under a draft which will burn even the driest tinder. Their trouble, naturally, is getting up a head of steam to start the wheels turning and make some progress.

The mental factors that make people lazy have been well studied in recent years by psychoanalysts in Vienna and Zurich, by industrial psychologists in England, and by vocational psychologists in America.

Daydreaming is reported by the psychoanalysts to be a prominent cause of laziness. It is easier for the mental



This thyroid gland is poorly developed, and was found in a sluggish, indolent person. Half of it is still covered with muscles, but the exposed half is thin and small. To the side of the thyroid, in the order named, can be seen the carotid artery, vagus nerve, and jugular vein. (*An unretouched photograph from the author's laboratory. Copyright 1935, D. A. Laird.*)

machine to take this course to idle reverie than to settle down to brass tacks and concentrate on some definite problem, although it is definitely known that we think faster when we are thinking constructively about a problem than when engaged in the pleasurable, albeit profitless, mental idling of "building castles in Spain."

Practically everyone goes through a stage of intensified daydreaming from the twelfth to twentieth year, and some apparently never grow out of this indolent period of reveries. The tramp has been found to be especially active in daydreaming. Reclining with his hat pushed over his eyes, he

packs the sward of the hoboes' jungle on the edge of town with his tattered clothes and dirt-encrusted body, while his mind wanders into Elysian fields, and although awake, his mind builds idle fantasies which serve no purpose other than their own fleeting generation. Like many other lazy adults, he is lazy because he still has the uncontrolled and undirected imagination of a youth.

Early in 1935, for instance, results of examinations of 6,261 beggars in New York City were announced. The check-up by physicians and psychiatrists showed that of this group, only the small number of 966 could be given a passport of "apparently normal." Laziness, truly, is a symptom of disease of body or mind, and it is usually the mind that is diseased or deficient.

We have previously mentioned the casual laborers, that army of a million of so odd-job, small-job, occasional-job floaters who really do not want a regular job and probably would have trouble keeping it if they did want it. More than one-third of these chronic loafers and intermittent troublemakers, are mentally abnormal, supplementing almost the same percentage who are lacking in general ability, the subnormal ones. The abnormal ones answer most of the questions given at the close of the preceding chapter with "Yes," if they are honest. The subnormal ones cannot detect the absurdity in the statement that the railroad wreck in which forty-eight were killed was not a serious wreck. Daydreaming excessively is one stamp of the abnormal emotional life and the friend of the lazy.

People daydream because that helps them surmount the difficulties of life through their imagination. Daydreaming solves no problems but gives us the deceptive and fleeting pleasure of imagining that they are gone. We simply try in a futile way to wish them away. Hard knocks, disappointments, and other similar mental experiences make daydreamers out of many folk, and by doing that, make them lazy people. This should give us sympathy with some lazy men and women of our acquaintance, but it does not

explain the greater laziness of men than of women, since theorists and practical scientists agree that womankind has more of these disappointments and frustrations to bear than do men.



Mental causes for laziness, particularly in men, are described by the English industrial psychologists and the American vocational psychologists. The humdrum monotony of almost ceaseless industrial tasks is found by the industrial psychologists to cause great boredom which naturally, and almost inevitably, leads to a mental condition readily promoting laziness. A state of being quickly fed up on daily work, lack of interest, and indolence follow.

Sometimes this laziness does not become generalized, and we see the lazy, stalling worker hurrying home from the factory to work like a horse in a flower garden or at building delicate and attention-straining models in a basement workshop at home. When interest in work wanes, laziness grows.

So many men in order to earn bread and fuel and clothes have to work at whatever is offered them, that this is almost a record-breaking cause of laziness. For this reason, when college students ask me what job they should take upon graduation, I always try to find out the job they, with their mental make-up, would probably find most interesting. For the same reason, in the laboratory I am always studying the interests of the individual students, to make certain I can get each to work on that one of the experiments we happen to have under way that will really fit in strongly with his basic interests.

The dumb man or woman—for there are some women low in general ability, also—has been discovered by the industrial psychologists to be a sort that seldom becomes bored with a job, no matter how monotonous it may appear. But men and women who are not dumb have to work at these same jobs, as well. This makes the tragedy

of the really intelligent people, who are more liable to become lazy; an important problem, a problem which those trying to remold the nation are ignoring and which may offset their entire theoretical system, in actual practice.

That is what makes so many persons ripe for the troublesome activities of the office politician and the professional agitator. People who basically do not like their job, slight though the gnawing dissatisfaction may be, are easy to convert to a frame of mind where they will do things of which later they will be thoroughly ashamed. Customers have to be interested in a product before they will buy it, and workers have to be interested in their work if business is going to run smoothly and profitably for everyone concerned. Yet approximately half of the workers are not interested in their work and are a perpetual hidden source of disaster to the business.

In some instances, as we have seen, this disinterest comes from within the individual himself, and nothing in the world which could be done to the job would make him any different; he would still lack interest in any possible work on which he might be tried. Such are the individuals who comprise the bulk of the membership of the radical labor organizations. What they are rebelling against is, after all, not industry but something they do not recognize which is peculiar to themselves and is gnawing away in their own unique mental lives. About this we shall learn some interesting things later, beginning in Chapter 9.

In other instances, the hopeful ones, the lack of interest rises from the fact that the person in question is engaged in a job which does not fit in with his own interests, but to which he clings tenaciously in order to make a living. This could be prevented, as we have seen earlier, by taking more care that men are placed in work which is in harmony with their basic interests.

In other instances—and these are hopeful, too—the lack of interest is due to unfortunate policies of the company itself. In such cases the disinterest is widespread throughout

the entire plant. It gives a high labor turnover and makes the business so expensive that competition cannot be met and solvency maintained at the same time. Receiverships and the bankruptcy courts get much of their business from firms who have overlooked the importance of labor policies and instead have concentrated on patents and finances.

Look back to the preceding chapter and study the scale showing what makes a job interesting. Then study your own situation and see what needs to be done to put those facts properly to work for you and for your employees.

In a period of "made work," to keep busy the hands of persons who are in want, we can easily understand, in the light of such facts, that job interest will be at a low mark, and that this disinterest is likely to increase, the longer the relief worker is manicuring the highways. The details of work, and its general circumstances, are such that it will make lazy persons out of those who were previously conscientious, diligent laborers.

Physicians are joking about a strange new disease which they claim some midwestern physician has discovered among such relief workers. It affects the blood, and seems to be contagious, so they report with a twinkle in their eyes. The iron in the blood gradually disappears while its place is taken by the heavy metal, lead. Then, so the report goes, the heavy lead accumulates in the *gluteus maximus* muscles of the lower hips to such an alarming extent that soon the patient can do nothing but sit down.

This iron into lead explanation is purely imaginary; but the affliction, unfortunately, is not imaginary. It is just a modern version of what has been known for generations as dropsy and heart trouble—the lazy person dropping into a chair and not having the heart to get up.

But we must not be too facetious, for the underlying situation is serious and perplexing. We shall continue in a serious mood.

Closely related are the discoveries made by the American vocational psychologists of the appalling rate of change of job interests. Ordinary people, as well as famous personages, quickly become bankrupt of enthusiasm under certain conditions. Frederick Keppel found that approximately half of men college graduates had widely changing vocational likes and dislikes; and Dr. Harry Dexter Kitson of Columbia University found that even among those in "Who's Who" a full 16 per cent had changed their vocations in a major way. In rare contrast are those who know what they really want to do and then proceed to do it successfully, in a straightforward and far from lazy manner.

There is the rare Roy Chapman Andrews, for instance, who knew full well at the age of ten that he wanted to be a naturalist and explorer and has steadfastly and brilliantly followed through, with no semblance of laziness. Or consider the brilliant young American writer, James Gould Cozzens, who knew definitely long before he entered college that he wanted to be a great writer; hewing without indolence to this line, he has seen the reading public buying 5,000 copies of one of his books in a single week during a period when bookstores were going into bankruptcy and book publishers worrying about the sheriff.

We are indolent and lazy until we find our right work. Until we find that, we go through spells of laziness, with the inherent hazard that they may become fixed habits. Of course, a few favored persons may be fortunate enough to have the wide opportunity to fill many jobs at the same time, like the Rev. W. P. Young, of Burlington, New Jersey, who "in addition to being a minister, is blacksmith, glass-sign manufacturer, gas station owner, insurance agent, and crack harmonica player," and who, more recently, has become coroner.

The stages that Robert Sessions Woodworth, distinguished head of the department of psychology at Columbia University, passed through are more typical of most folk. First he was going to be an astronomer, then going back to

the land, he became a farmer, afterward a musician, then a minister, then a philosopher, then a deep student of physiology. Finally choosing psychology, he has been a powerful influence in guiding American psychologists from fascinating but futile fads and isms.

Thus we see that from among people who have not found themselves, or who are not satisfied with themselves inwardly, comes a large proportion of our vast army of lazy loungers. Sympathy is due to the lazy person, but from his experience we should gain insight into ourselves and our children, our employees, and our associates.

Some seem never able to gain such insight, however. Such was the case with the writer of a letter I recently received from Nova Scotia. He was a man just passing into middle age. He had found one of my articles interesting; but instead of writing in appreciation, he wrote asking me to tell him, "what job he could get that required no work at all and would make him rich."

CHAPTER 8

ABILITY TO GET ALONG WITH PEOPLE

The executive must know people and how to get along with them, as well as be master of the intricacies of the mechanical and financial aspects of his own job. That is what Alfred P. Sloan, Jr., president of General Motors Corporation, had in mind when he said:

"The human problem is far more delicate and difficult to handle than any production problem or distribution problem or engineering problem or financial problem.

"Psychology and personality constitute at least 50 per cent of the material requisite for success as an executive. I have seen men with fine minds who failed to make their plans effective because they lacked understanding of how to work with people. In our business I should say that this psychological ability means 75 per cent of the necessary equipment. The ability to get people to work together is of the greatest importance."

Why are so many persons whom we look upon as exceptionally intelligent, such signal failures in everyday life? Likewise, why are so many men whom we consider, perhaps, little better mentally than morons, successful and liked well enough to hold high offices in business or in public service?

Here, certainly, is a mystery that in one form or another has presented itself to all of us. The splendidly educated man wearing shabby clothes and holding an unimportant job, and the blockhead who can talk about nothing more important than burlesque and horse racing but who has

managed to secure for himself kingly clothing, houses, offices, and friends are familiar types. Not long ago, the newspapers disclosed that a certain Harvard prodigy who was graduated at about the age when an average boy begins college was, a dozen years later, no further along than a fifteen dollar a week clerkship in an insurance office. Almost everyone knows, too, a one-time classroom dunce who has turned up later as a big-time business executive.

Curiously enough, the solution, which recently came to light through psychological researches by such men as Dr. Fred A. Moss, of George Washington University, and Professor Harry W. Hepner, of Syracuse, like most good solutions, is almost as simple as "rolling off a log." It is this: Intelligence in humans is of at least two distinct types, "social" and "abstract." They are more or less mutually exclusive and about as different in operation as oil and water. And so far as success in life is concerned, social intelligence appears to be important. Though social intelligence never could gain one a reputation in the neighborhood of Einstein's, it might very well, if you possessed it in high enough degree, make you president of the United States.

There are folks who possess both abstract and social intelligence in about equal measure, as for example the late Theodore Roosevelt. In most of us the relative proportions vary widely, and in many individuals one type predominates to such an extent that it overshadows the other and may even rule it out altogether.

"A careful study of the qualities of the so-called successful man," says Dr. Moss, "will reveal, in nine cases out of ten, that his success depends not upon his deep and profound knowledge which puzzles the brains of ordinary men, but on simple and more commonplace qualities which please the understanding of the common folk and arouse in their hearts a feeling of sympathy. For all practical purposes, social intelligence wins over abstract intelligence,

ten to one. Abstract intelligence knows what to do, but social intelligence knows how to get it done."



Let us look at the two types in action. Assume that there is a cause which you are advocating and to which you are trying to win adherents. You make a call to present your argument to a man whose intelligence is of the social type. As he listens, these are the things that impress him: your appearance, as indicating what kind of fellow you are; your facial expression, as indicative of your mental states; your manner of speech, as giving clues to your feelings and emotions, your honesty, sincerity, and disposition toward him; your clothing, as indicative of your financial condition.

Later, you put your case before a man whose intelligence falls into the abstract class. He too listens, but unlike the first man he scarcely considers *you* at all; on the contrary, he thinks only of what you are saying, of your proposition and its aspects, financial, legal, ethical, or social, as the case may be.

Then, what happens? In the case of the man with marked social intelligence, his decision is based upon you. If he likes you, he is inclined to go more deeply into the matter; and he does it by using his study of you to win your sympathy and friendship and confidence, just as you have won his.

On the other hand, the fellow with marked abstract intelligence is as cold and as unacquainted with you as he was at the beginning of the interview; he makes his decision for or against on the basis of cold facts, both in the proposal and related to it.

Ten to one, when you leave the first man, you are anxious to benefit him and to see him again; whereas, in leaving the second, you are anxious only to get his business or his money. Which, do you think, has the better chance of getting a bargain at your hands?

Or suppose that the man of marked social intelligence comes to you seeking a job, promotion, a loan, or a political boost. Then comes a man of strong abstract intelligence on the same errand. Is it not clear what is most likely to happen? The first makes friends with you, studies you, and so comes to know just how to handle you to his own benefit; while the second simply rates his case on the logic of his argument, and after he is gone you scarcely think of him again. 'Is it any wonder that social intelligence means so much in winning what we call success?

Significantly enough, we see this rule working out in the lives of scores of great figures, past and present. No better example of the man with abstract intelligence could be found than the late Woodrow Wilson. Seeing human beings in the mass, he wanted to better the condition of mankind as a whole; but he was continually at odds with individuals, as his frequent breaks with cabinet members proves. He could plan the course of Europe after the war, but found himself all but incapable of understanding and dealing successfully with the individual statesmen at Versailles.

We see Warren G. Harding, a man of comparatively small abstract intelligence, becoming president because he had high social intelligence, which won him hosts of friends everywhere.

"Charley" Schwab, the steel master, would be the first to admit that perhaps his biggest asset was his ability to study, understand, and win to him persons in all walks of life, from the mine and the mill to the citadel of Wall Street. We see Einstein, possessed of probably the finest abstract intelligence of his time, baffled and puzzled by American newspapermen; we see Grandi, the Italian foreign minister, who, quite probably, couldn't begin to grasp the Einstein theory, understanding, liking, and winning the admiration and friendship of those same newspapermen as well as almost everyone else with whom he came in contact while in America.

An old faithful rating scale of personality for the sales clerk¹

Directions: Indicate your rating by placing a check mark on the line just where it ought to be. You do not need to check directly above the descriptive phrase. For example, if in quality Number 1 the person whom you are rating is somewhere between "Teachable" and "Eager to Learn," place your check on the line somewhere between these two points. Consider only one quality at a time.

Name of rater..... Name employee rated.....

Position..... Number. Position..... Number.

Qualities:

Report

1. Willingness to learn

Refuses suggestions	"Knows it all"	Teachable	Eager to learn
---------------------	----------------	-----------	----------------

2. Sales talk vocabulary

Fluent	Good	Average vocabulary	Poor	Very limited vocabulary
--------	------	--------------------	------	-------------------------

3. Voice

Unpleasant, irritating	Lifeless	Easy to listen to	Very pleasing—mellow
------------------------	----------	-------------------	----------------------

4. Speech

Speech defect	Awkward speech	Fairly clear	Very clear, denotes confidence
---------------	----------------	--------------	--------------------------------

5. Adaptability to buyer

Sizes up buyer at once	Fairly adaptable	Treats all buyers same	Simply takes order
------------------------	------------------	------------------------	--------------------

6. Dexterity in demonstration

Doesn't display	Awkward at demonstration	Fairly clever hands	Hands and body graceful in demonstration
-----------------	--------------------------	---------------------	--

7. Persistence in a sale

Doggedly persistent	Persists without angering buyer	Takes first sign of "no" answer
---------------------	---------------------------------	---------------------------------

8. Point of view

Takes buyer's point of view	Sale is merely another job	Selfish end, thinks of commission
-----------------------------	----------------------------	-----------------------------------

9. Personal neatness

Slovenly, usually clothes shabby, hands dirty	Careless about appearance sometimes	Usually tidy, neat	Always very clean and neat
---	-------------------------------------	--------------------	----------------------------

10. Bodily odors

Perfumed excessively	Moderately perfumed	Inoffensive, no perfume	Offensive breath and odor
----------------------	---------------------	-------------------------	---------------------------

¹ Devised by Dr. George H. Gallup, reprinted from *Industrial Psychology Monthly*.

An old faithful rating scale of personality for the sales clerk.—Continued

Qualities	Report		
11. Carriage	Arrogant, very proud	Athletic but not haughty	Awkward, ungainly
12. Nervousness	Very nervous, irritates buyers	Rather excitable	Calm, deliberate
13. Likability	Well-liked, "good scout"	Fair mixer	Unsociable
14. Interest in the firm	"Knocks" store	No interest, works for wages	Passive loyalty
15. Knowledge of his line	Ignorant of product	Poorly informed	Fairly well informed
16. Worthy of promotion	Very deserving	Gives promise for future	Little hope of it
17. Improvement	Very rapid	Moderately progressive	Slight
18. Accuracy	Always pulling boners	Blunders occasionally	Not improving
19. Ambition	Very eager to get ahead	Ambitious but doesn't try	Not very ambitious
20. Ability to meet emergencies	Unable to meet emergencies	Average ability	Tactful in emergencies
21. Punctuality	Never tardy	Usually punctual	Often undependable
22. Courtesy	Always courteous	Usually courteous	Sometimes inconsiderate
23. Temper	Very excitable, "loses head"	Fairly even-temper	Calm, quiet
			Perfect self-control

We see Immanuel Kant, German philosopher, whose abstract intelligence certainly never has been surpassed, living in comparative poverty, shunning his fellow men, laughed at and ridiculed by his neighbors, in short, not having enough social understanding to understand them or make himself understood by them; and we see the late Charles F. Murphy, "boss" of Tammany, with comparatively negligible abstract intelligence, or ability and desire to understand any higher forms of human thought, raising himself by social intelligence from his saloon bar to practical control of the greatest city in the world.

The boy who could not get along in his classes and flunked out, but afterward became a big business figure, was not always a ne'er-do-well at school; often his mind was of the type that did not understand or want abstract education, but probably it was the type that understood human beings, liked them, and therefore could manage them. On the opposite side was the lad who was a "whiz" in school, but who when he got out where he had to understand people and get along with them was "stumped." He simply had a different type of intelligence. Considering these things, we see why so many persons without the least interest in education or higher forms of thought—boot-leggers, Broadway touts, nightclub figures, gamblers, and even criminals—become popular, powerful, and even admired. Whatever their abstract intelligence, their social intelligence is far above par. And we get at least an inkling as to why so few of our national presidents have been men of high abstract intelligence. It takes high social intelligence to win votes, and the two types seldom team up in anywhere near equal degrees.

Using a test for social intelligence, Dr. Moss weighed the intelligence of hundreds of persons. Among other things,

he found that executives as a class have more social intelligence than salesmen; salesmen, more than stenographers; stenographers, more than factory workers; women, slightly more than men; and smokers, more than non-smokers. In each class, naturally, there were exceptions to the general rule; but it is probable that the exceptions are folk who will sooner or later come to have a better understanding of their own intelligences and so will be better able to fit themselves into the economic scheme.

Can social intelligence be acquired? To a degree, yes. But the evidence is very strong that a true liking for people, which is the basis of it, can no more be developed than a true love for mathematics. Therefore, the soundest course is for the individual to determine which type of intelligence he or she has, or which type his son or daughter has, before selecting the activity or profession of a lifetime. In this way, for instance, one may avoid trying to make a social worker of a born mathematician, or a research scientist out of a born evangelist.

The way different work lines up, so far as social intelligence is concerned, is given by the following listing: *High social intelligence needed*—general executive, high-grade supervisor, messenger boy, office manager, politician, president, salesman, superintendent, traffic manager, welfare supervisor, or social worker. *Average social intelligence needed*—accountant, chief or supervisory clerk, employment manager, foreman, photographer, nurse. *Low social intelligence needed*—automobile or truck driver, chemist, draftsman, electrician, laborer, machine operator, mechanic, office clerk, printer, research or laboratory worker, stenographer, technologist.

A specimen test for measuring social intelligence is given in full, starting on page 317 of my book "The Psychology of Selecting Men."

"They are going to cut down the department!"

The rumor starts in a whisper and soon is a full-bodied chorus. Everyone buttonholes everyone else for inside information. Days of uncertainty elapse before the ax falls, the final announcement is made, and it is known who is to go and who to stay, who is to be transferred and who given the chance to hang on in a smaller and less remunerative job.

During such days of uncertainty many personal truths will have been learned; out of them may come countless men and women, with more self-knowledge, better poise and greater competence because of having passed through them—countless men and women purged of old personality mistakes and handicaps, which were overlooked in the boom of prosperity; more than ever aware of personality advantages, and so better able to use such gifts to advantage.

Assume that you are one of these workers forced to weigh himself or herself. You are "out," as the saying is. You frown and try to think the thing through. Why are you "out"? Weren't you with the firm so long, and didn't you always do thus and so? Of course! But after awhile the speculations become like a forest, trackless, in which you can see no light or truth. You shake a baffled head. If only there were some guide to the truth in the matter, some clue to the real reason why you, rather than the other fellow, lost ground!

Well, there is a guide. Psychologists have been fifty years or so carrying on experiments to just this end—to help human beings understand themselves and others, their strengths and weaknesses, and to cash in on one while cutting loose the other.



One of the most interesting researches along this line that I know has been made at Purdue University. It is no matter of tests in a laboratory, sound and enlightening as these are, but a test of a group of professional workers in the

actual give and take of industrial life. It aims to answer the question, What quality or qualities will bring success in the inevitably competitive field of business? If we were to answer offhand, eight out of ten would say, "brains"; others, "luck"; and others—let us be honest—"crookedness." But suppose we go, figuratively, to Purdue.

It was several years ago. The senior class in engineering was representative enough, including the usual variety of types and temperaments. The university psychologists made a special study of these students, grading them not only as to general ability but also on some aspects of social intelligence—as to whether each had a pleasing or an unpleasing personality. Record was kept of their classroom marks and of their personality traits as well—the habits of thought, manners, speech, and conduct that might be presumed to make them liked or disliked. The boys were graduated; the records filed.

Five years later, the psychologists looked up the members of the group. They were scattered in various businesses over most of the country. Some were married, some not.

How far had they gone in a business way? Those who in college had displayed the best general intelligence were earning, on the average, not more than \$150 annually above those whose "brain power" had been shown to be no more than of average college grade.

But on the basis of pleasing or unpleasing personality, the case was surprisingly different. Irrespective of high-grade intelligence or the lack of it, the engineers with pleasing personalities were receiving an average income of \$3,000 yearly, while those of the opposite personality type were receiving \$2,076.

In other words, high-grade brains—pure intelligence, or whatever you choose to call it—was worth about \$150 more a year to a man, while high-grade personality was worth nearly \$1,000 more!

No doubt all had done the work assigned to them; they were all well equipped as engineers; but other qualities,

qualities of personality, had brought to some advancement and promotions which were not a part of the lot of the others.

And what were these traits of personality that made such a difference? The record shows that the really outstanding qualities in the \$3,000 group were tact, self-reliance, enthusiasm, accuracy, and aggressiveness. Second to these ran industry, sincerity, sympathy, originality, social and civic interest, reliability, cooperation, and general information. While third and last in the race were those oft-praised characteristics, neatness and a sense of humor.

The most interesting part of this long test is ahead. When, let us say, five years from the last reading of the record, the psychologists at Purdue again examine the progress of the engineers, what will be the result? None of the subjects will have been able to increase by a jot his brain power as such, for that, as science has amply demonstrated, cannot be augmented. We are born with a certain potential general ability and we die with that same ability, developed and realized to the full, or dormant and neglected.

On the other hand, will not some of the poor-personality men have learned? Will they not have looked into themselves, perceived their lack, developed the profitable traits listed above, and so been able to step into the leading group? It can be done—this developing of good personality—and it appears to me that this is a capital time for anyone to begin. Indeed, I cannot resist setting down the slogan, "Be ready for the next boom with a better organized personality."

How?

Sit down with yourself and look back. Or better still, sit down with a friend and ask his frank opinion of your work and conduct in the old firm before the reorganization. Incidentally, in so doing you will be following splendid examples. To cite but one, there is Abraham Lincoln, who not

only spent a great deal of time alone, striving to understand himself and others so that personal and political conflicts might be smoothed away, but invited the frankest and

How do others see us?

Whatever our personality really is, its effect on others is important. Here is a personality chart which shows how one fairly successful person estimated his own personality to be very different from what others thought it was. The "x" shows where the person thought he rated, the "a" shows the average of his actual ratings as given by five acquaintances.

	<i>High</i>	<i>Average</i>	<i>Low</i>
Appearance			
Neatness.....	....x.		....a...
Stylishness.....	....x...		....a.....
Suitability to job.....	....x..		....a.....
Pleasantness.....	.....		....a.....x.
Accessibility.....	.....	x.....	....a...
Frankness.....	....a.		....x.....
Talkativeness.....	....a.		....x..
Sincerity.....	....x.		....a...
Poise.....	.....	x.....	....a.
Initiative.....	....x.		....a.
Self-reliance.....	....x.....	a.....	
Self-confidence.....	.....	a.....	....x.
Shrewdness.....	....x.		....a.
Persistence.....	....a.....		x.....
Carefulness.....	....x.....		a.....
Conscientiousness.....	....x.		....a.
Cooperation.....	....x.....		a.....
Dependability.....	....x.....		a.....
Sociability.....	....a.....	x.....	
Understanding of others.....	....x.....		a...
Enthusiasm.....	.....x.....		a.....
Ambition.....	....xa.....		
Liking for people.....	.....x.....		a.....

most critical judgment of himself and his acts from his intimates. He was forever struggling to make himself a more understanding, more cooperative human being; and

he came through the war days, with all their rampant hatreds, one of the best beloved of men.

We have given a rough chart of personality traits. Take the chart, and being honest with yourself, set down where you think you stand in the possession of the personality traits enumerated. Then, having done that, ask two or three friends to make a similar record of your personality, without, of course, letting them to see your own tally or one another's. Comparison of these personal and friendly records will give you no end of light upon yourself, as the same test has done for others.

You may have done your specific work in the old office exceedingly well, whether it was bookkeeping, purchasing, drafting, directing, or whatever. But it is possible that as you look back you may find you depended upon that alone. You did your work and no more. You did not, perhaps, see it in relation to that of the others about you. Maybe, because of your superior technical knowledge and skill, you even made others antagonistic. For, truthfully, nothing is more productive of animosity of this sort than superior ability which is, consciously or unconsciously, forever making the other fellow realize his own shortcomings. It requires considerable tact sometimes to put over superior talent in our closely organized, highly competitive industries.

Look at the fifth trait enumerated upon the chart. It is "Accessibility." It may be that you prided yourself on your accessibility to others. Perhaps the door of your office always was open. And yet, in retrospect, you may realize that even though friends and others could see you, they found no interesting warmth and suggestion of cooperation in you when they did come in. You were there, you were doing your duty as you saw it, but you were still remote and distant. Your material body was there, but perhaps your heart was not there. Your superior may have sensed this aloofness and the coldness that it generated may have been the determining factor, so far as you were concerned, in the reorganization.

A man of my acquaintance, caught in just such a cutting-down process, took the chart test recently. The divergences between his opinions of himself, and the average estimates of five of his friends, were so astonishing that he grew pale, and I do not know that he has fully adjusted himself to the judgment to this day. However, he is fine-souled and intelligent, and in the end can but profit by it.

He estimated, for instance, that in frankness he should rate about 50 per cent; while his friends thought 90 per cent nearer right. On the other hand, he considered himself almost perfect in the matter of conscientiousness, while his intimates gave him almost no credit at all for the quality. When it came to talkativeness, he fancied himself a veritable Sphinx, though his fellows rated him as all but in a class with Eddie Cantor in one of the latter's talkies. He believed himself the acme of shrewdness, while his critics gave him a mark of about 10 per cent. And curiously there was only one point on which they all agreed. He put himself down as far more than ordinarily ambitious; so did they.

The great value of the analysis, however, lies in its capacity to guide and direct one's analysis of himself. When the searcher of his ego thinks of a quality with relation to himself, he should likewise consider incidents in the old firm where he did or did not display that quality. That kind of thought contains true revelation. Did he or did he not in a given instance act with poise and sincerity and understanding? Somewhere in his soul, as he goes over such memories, he will come to see the true fact. Through the chart, his friends will help, too. And with these discoveries about himself as a beacon, he may shape for himself a truer course, and may have a finer, fuller, and more successful life, when the wheel turns up again for him—and it will, you mark me!

Let us look, for a few pages, at some positive aspects of the cultivation of the ability to get along with people.

Have you ever stopped to think why you dislike certain people? Or why they may dislike you? This all-important, but little-considered question came up recently among the students at the psychological laboratory of Colgate University. The realization that among their number were fellows looked up to but not liked, others almost universally liked, and a few heartily disliked, crystallized into a research which, I think, uncovered information of exceptional value for all of us, whether student or professor, business or professional man, executive or subordinate.

One very telling point was established almost at the outset. The 130 men who took part in the experiments were asked at a given signal to begin writing down as speedily as possible the initials of all persons they particularly disliked. Half a minute later, this listing of dislikes was as suddenly stopped. Many of the list-makers had not been able to think of more than one individual they disliked. Others consumed the time at top speed and still had not exhausted their pet human aversions. Certain of them had noted fourteen! Later it developed—and here was the vital point—that those most given to minor hates were themselves the most unpopular.

Also, the conviction was soon forced upon us that the explanation of human likes and dislikes for other human beings lies almost wholly in the actions of those other human beings: first, in actions that tend to strike at our pride and opinion of ourselves, and second, in acts that irk, disturb, and distress us.

But after all, these generalizations did not tell specifically why persons were disliked. Again, the students were asked to write, each to portray some person whom he regarded with repugnance, with emphasis upon unliked traits of character, personality, or conduct. Sisters, fraternity brothers, landlords and landladies, all between sixteen and sixty were the subjects of these articles. (Before the experiments ended, there was sound reason to believe that some of the "landlords" and "landladies" were

parents of the writers!) Leaving out of consideration unnatural traits which could have no general significance in this problem of likes and dislikes, such for example as stuttering, we found 91 traits, of a type that could be considered universal, that appeared with relative frequency.

Here then was a good starting point. Here were "dislike traits" that had every chance of being resented by great numbers of persons. Next, we had each of the men produce a study of a second person disliked, this time confining the picture to the 91 causes of aversion culled from the previous articles. Then, we had them do a third study, this time of a person whom they liked very much—sweethearts excluded, in all fairness—with relation to the same 91 traits. The group was deeply interested, as you may imagine, and the whole program was carried out with rigorous and scientific honesty.

The next step was a comparison of the 130 well-liked persons, as a group, with the 130 disliked subjects. How many in the last group and how many in the first group possessed one or more of the 91 "dislike traits"? In other words, how true were these traits as universal indicators as to whether an individual afflicted with them was apt to be liked or disliked? We found, by the use of appropriate mathematical methods that there were, on the basis of this research, 45 traits in which the chances are only one in 740, at least, that they will not prove, in any given case, sound and inevitable causes of dislike. That is, if you possess one or more of them, the chances are at least 740 to one that you will be disliked rather than liked by people you meet. Individuals knowing favorable traits about you, may overlook them; but on the other hand, strangers, new acquaintances, and the like may not. Indeed, probably they will not.

On the basis of our previous generalizations, these 45 traits divided themselves into three groups, in the order of their importance, as is shown graphically by the personal test chart displayed later in this section. And while, as I

have said, under the mathematics of probabilities, the chances in each case were at least 740 to one that a trait would be generally a dislike starter, it was found that for those traits in Group I, the chances of their being dislike breeders were around 1,000,000 to one!

Incidentally, the personal test chart will permit anyone to obtain a self-portrait as far as the possession of "like" and "dislike" traits are concerned. As you see, the questions are couched in such form that the answer "Yes" indicates the absence of the aversion-producing trait. The score is made by giving yourself a count of three for each "Yes" in the first group, a count of two for each affirmative answer in the second, and of one for each such reply in the third, or least important. Seventy-nine is top card and the experiments have shown that only about 10 per cent of human beings can honestly obtain it. Low is about 56, while 64 is average for young folks. But you will note that each one of these traits, important as they are, can be changed by the individual; that all can, with care and determination, be eliminated. That, as I see it, is what makes the test of supreme value to everyone, especially to persons engaged in making contacts each day, the friendly contacts upon which good business and success depend.

Traits which make us liked

Give yourself a score of 3 for each of these questions to which you can answer "Yes":

1. Can you always be depended upon to do what you say you will?
2. Do you go out of your way cheerfully to help others?
3. Do you avoid exaggeration in all your statements?
4. Do you refrain from showing off how much you know?
5. Do you avoid being sarcastic?
6. Do you feel inferior to most of your associates?
7. Do you refrain from bossing people not employed by you?
8. Do you keep from reprimanding people who do things that displease you?
9. Do you avoid making fun of others behind their backs?
10. Do you keep from domineering others?

Give yourself a score of 2 for each of these questions to which you can answer "Yes":

11. Do you keep your clothing neat and tidy?
 12. Do you avoid being bold and nervy?
 13. Do you avoid finding fault with everyday things?
 14. Do you avoid laughing at the mistakes of others?
 15. Is your attitude toward the opposite sex free from vulgarity?
 16. Do you let the mistakes of others pass without correcting them?
 17. Do you loan things to others readily?
 18. Do you let others have their own way?
 19. Are you careful not to tell jokes that will embarrass those listening?
 20. Do you always control your temper?
 21. Do you keep out of arguments?
 22. Do you smile pleasantly?
 23. Do you avoid talking almost continuously?
 24. Do you keep your nose entirely out of other people's business?
- Give yourself a score of 1 for each of these questions to which you can answer "Yes":
25. Do you have patience with modern ideas?
 26. Do you avoid flattering others?
 27. Do you avoid gossiping?
 28. Do you refrain from asking people to repeat what they have just said?
 29. Do you avoid asking questions in keeping up a conversation?
 30. Do you avoid asking favors of others?
 31. Do you avoid trying to reform others?
 32. Are you usually cheerful?
 33. Are you natural rather than dignified?
 34. Do you keep your personal troubles to yourself?
 35. Are you conservative in politics?
 36. Are you enthusiastic rather than lethargic?
 37. Do you pronounce words correctly?
 38. Do you look upon others without suspicion?
 39. Do you avoid being lazy?
 40. Do you avoid borrowing things?
 41. Do you refrain from telling people their moral duty?
 42. Do you avoid trying to convert people to your beliefs?
 43. Do you avoid talking rapidly?
 44. Do you avoid laughing loudly?
 45. Do you avoid making fun of people to their faces?

Now, let us examine some of these traits by way of illustration. Look at No. 1, "Can you be depended upon to do what you say you will?" No doubt every one of us has

met persons who on first meeting seemed charming and likable and whom we wanted very much to meet again. And just as surely, we have found later that we did not like them because they never lived up to their promises and were usually making excuses for some dereliction in this regard. True, some persons, even bosses, overlook this kind of thing once, or perhaps several times, but the end is nearly always the same—dislike, or enmity. Certainly, it is seldom, if ever, promotion.

Equally related to the business side of life is the hint for all of us in Question 9, "Do you never make fun of others behind their backs?" The other day, in connection with other work in psychology, I ran across a bull's-eye example of how this trait—that of making fun of others behind their backs—may shatter a man's friendships and his business success as well.

The man in question was far above the average in competence, training, and personality. He was, too, a genuinely hard worker, with a stellar record as an executive. An offer came for him to assume charge of a manufacturing business in a Western city. The salary was attractive, along with other conditional awards, and he accepted at once. His new employers were as tickled as he, because they felt they had put over a "ten strike" in the personnel phase of their business.

But in a short time the whole transaction took on the guise of a blunder. The new executive was widely avoided and distrusted by his staff and fellow workers. This more or less mysterious situation had disrupted the general morale and cut down the profits; something had to be done. Now, oddly enough, it was the new man who finally ferreted out the "nigger in the woodpile." It all traced back, he saw, to his old love of making fun of folks behind their backs. He had considerable histrionic talent, and greatly enjoyed telling tales, about this fellow's wild explosion after a weird golf shot, or that one's discomfiture on being caught in an office mistake. You see what had

occurred? Even those who chortled with him at others could not in the end refrain from speculating what he might say about them behind their backs. And the outcome had been that everyone came to fear and to dislike him, to long to see him move on!

As the records of those who have taken this highly interesting test show, however, combinations of qualities that produce dislikes are the rule rather than the exception. Indeed, some of the "dislike traits" seem to run naturally together, to be the outgrowth of a particular temperament or outlook.

There came to my attention recently, for instance, the case of an employer who could never, by any stretch of the imagination, have written "Yes," to Questions 4, 5, 8 and 10. His business had come down to him from his father. For a time he had managed to keep it on an even financial keel. Gradually, though, it began to run behind and finally landed him in bankruptcy. Those who knew him well professed little surprise, and no particular sympathy. In his trouble, no one seemed to care about him. As he was a man given to staying up most of the night, what with one dissipation or another, both before and after his crash his nerves were usually ragged. He had a sarcastic tongue and a domineering attitude, especially toward those who had worked with him. The presence of women almost invariably made him an offensive and impossible show-off. It was a clear case of earned dislike and failure.

It seems to me that several of the traits set down in the first group on the chart might well be given especial consideration by men and women in executive posts. They are folk who must continue to display knowledge; they must give orders; they must criticize. Unless they do all these things with fine social understanding, and compensate for the necessity of doing them by showing many other attractive qualities, they are likely to fall heir to much dislike, more or less unmerited. For all these duties tend, in operation, to "take down" the other fellow's

opinion of himself. And that, I am certain, is basically one of the chief reasons why the younger generation so often develops an aversion for the older; why the subordinate so often groused secretly against his chief; and, let us admit, the student sometimes dislikes the professor.

Somewhat the other side of the picture—that is, the illustration of the traits suggested in the other two groups, which may be said to come more under the heading of irksome, disturbing, and distressing things—is put under the spotlight in the experience of a Colgate man who took the test. His was, he admitted, the lowest score of the entire 130. In addition to that he was, by the revelations of his fellows, the most disliked among them. This was all the more astonishing because, on a superficial survey, he might well have seemed to be one of the most popular. He had good looks and good bearing, plenty of money and clothes, was a fine athlete, could make “the piano talk,” and came of good family.

Why then was he so unpopular? As the chart showed, he was forever showing off. He had the offensive habit of mentioning common table articles by their chemical names, as though he alone knew these. He seldom, if ever, did the other fellow a favor, but thought nothing of requesting others to go out of their way for him. He was, too, an unconscionable borrower, especially of cigarettes. Shades of Questions 2, 5, 17, 30, and 40!

Yet it speaks volumes for the man and the test that, once he had secured an honest picture of himself as others viewed him, he managed to correct his faults to such an extent that his case became a laboratory byword. He was a new man. May his experience move others who read this brief account to take the test and therein find, perhaps, a surer road to stronger friendships and more enduring business associations.

(A more detailed account of the factors discussed in this chapter will be found in my books “Why We Don’t Like People” and “More Zest for Life.”)

CHAPTER 9

PEOPLE HARD TO GET ALONG WITH

"Successful industrial management in the future," says Charles M. Schwab, "is going to depend more and more upon management of men rather than upon the organization of machines and other problems which are ordinarily considered in the sphere of practical engineering. Experience shows that industry's most important task in this day of large-scale production is management of men on a human basis."

But how difficult it is to manage some human beings! To many people, for instance, the sign in the park "Keep off the grass" stirs a desire to step over the fence and walk on the grassy ground; when the traffic light changes, there is an urge to run past it; the words "No Admission" make them itch to push the door open and walk in. Many individuals are ready to argue on the other side of almost any question, although up to the moment the subject was mentioned their thoughts were in sympathy with the proposition—an exhibition of contrariness.

Psychologists have given this common garden variety of contrariness the too-dignified term of negativism. This innocent-sounding word "negativism" unfortunately makes stubbornness seem more innocuous than it really is. The true social nature of stubbornness is shown by such equivalent words as obstinacy, sulkiness, sullenness, willfulness. David Harum was thinking of this trait when he described a person as "a constitutional aginer."

Persons who have a strong streak of negativism—and some folk have it much more seriously than others—are inclined to try to make this real blemish on their character look as if it might be a strength by calling it a strong will,

or a dominating make-up, or some such thing; or by saying that they are broad-minded and want to look on both sides of a question—which usually means they want to take the other side.

The headstrong willfulness of Henry IV of Germany lost him most of his friends, and Pope Gregory VII put the German monarch through a scene of great degradation



A simple test for negativistic personalities is to touch their elbow lightly, pushing it slightly ahead, without telling that it is being done. The negativistic person can usually be counted upon to resist this intrusion on his rights by pulling his arm backward.

because of this trait of stubbornness. Before the Pope would admit the willful Henry to his presence, the ruler had to dismiss his attendants, remove all the trappings of royalty and wear instead a coarse woolen tunic; barefooted, he had to stand for three days in the uncomfortable gateway, without food and praying for mercy.

Maeterlinck showed his stubbornness by sulking like a child.

In some persons contrariness is shown not so much by direct obstinacy, or sulking, as by a fondness for arguing or debating. Organized debating, as a matter of fact, might be roundly condemned for its undesirable effects in increasing the tendency toward contrariness. Indeed, the late Theodore Roosevelt and Professor William H.

Burnham of Clark University both did condemn organized debating for this reason.

A strong streak of negativism is an important element in the development of the mind of the radical. The habitual radical might also be described as a "constitutional aginer" who has got hold of some facts and has a few brain cells still alive. Such radicals often are actually against things merely because there are so many in favor of the other side.

Sometimes one member of a jury, who has a fixed and unshakable opinion, will hold out against all the arguments of the other eleven jurors. Thus Mrs. Orville Jones in a Pennsylvania court made up her mind before she entered the jury room, and stuck to her decision throughout the night, while the other members of the jury argued with her. During the discussion Mrs. Jones took out a hairpin and thread and began placidly to knit.



Contrariness springs from the interesting mental mechanism of ambivalence. This means that the subconscious idea which is in the background of the thought dominating the mind at any moment is the exact opposite of the apparently dominating idea. This is shown by experimental demonstrations in which a person is asked to tell the word which comes into his mind first as the experimenter gives a single stimulus word. Thus when the experimenter shouts "cold," the average person usually has "hot" as the first word that pops into his mind. In the same fashion, "black" suggests "white," "high" suggests "low," "up" suggests "down," "heavy" suggests "light," "fast" suggests "slow," etc.

This is true for each person's mind; everyone has the mental basis for readily being contrary, and the wonder is that there are not more habitually contrary persons in the world. This ambivalent nature of mind needs to be controlled and directed, otherwise thinking becomes

like dreaming, where we almost invariably fool ourselves by explaining that a dream which appears unpleasant really means a conscious pleasure.

The entire body, in fact, is put together along lines of opposites, giving in a sense a biological background which makes it too easy to become contrary. The muscles which move limbs are arranged in opposing pairs; one section of the autonomic nervous system works contrary to other sections.

In some mental disorders, contrariness is the outstanding symptom. Tell a patient with catatonic dementia praecox to sit down, and he will stand up; to whisper, and he will shout; to open his mouth, and he will lock his jaws firmly. I have seen such a patient drink a glassful of strong vinegar when someone who did not understand the condition jokingly told the patient not to drink the vinegar. While most people are suggestible, and act along the lines suggested, this patient, as well as the ordinary contrary person, is what is known as contra-suggestible.

Stubbornness, or contra-suggestion, shows itself early in life. A study made by Drs. D. M. Levy and S. H. Tulchin of more than a thousand young children at country fairs in Illinois shows that negativism in childhood appears first at about six months of age, then gradually rises to a high point from which it falls to what might be called a person's normal negativism at about five years of age. These two investigators found that baby girls were much more negativistic than boys. Dr. M. M. Reynolds, studying two hundred young children, found that the normal children became less negativistic as they grew older; so that an adult who is negativistic is in a sense revealing a childish trait which he has not yet outgrown. Dr. Reynolds also found that the more intelligent children were less negativistic; so the contrary adult is not only, so to speak, childish, but also relatively dumb. Dr. Reynolds's findings have been confirmed independently by Dr. J. F. Nelson.

These research workers, as well as Dr. Florence L. Good-enough, find that negativism is not a universal trait. This

is hopeful. It means that some people may be very negativistic, while other people are very complaisant, with hundreds of thousands of people scattered between these two extremes. It is the complaisant people who make it possible for such conditions as organized society and business cooperation, to exist, while markedly negativistic people are the ones with a tendency to make life for others a "pain in the neck."

Peter Stuyvesant, he of the silver encased peg leg who was governor of divers Dutch colonies in the seventeenth century, was almost as famous for his stubbornness as for his booming voice. His obstinacy kept his subjects constantly in troublesome revolt. Philip II of Spain had almost as much despotic obstinacy and made his subjects look upon him not as one with whom to cooperate but as a cruel bigot. Louis XIII of France may have been obstinate for a different reason. He had an impediment in his speech which made it impractical to talk things over.

There is some research evidence which indicates that one reason some adults still have a large amount of this childish and dumb trait of negativism is because of too much supervision by parents. Children whose parents are continually trying to keep them from doing things by saying, "No, no," are in a very real sense developing their children into being contrary adults who want to have their own way, and whose own way is usually the opposite of the way other people want. Instead of wishing to fight the contrary person, we should perhaps hunt up his parents and trim them down. Madame Elizabeth de France, daughter of the Dauphin Louis, was proudly obstinate as the result of being a pampered and spoiled child of royalty.

Woodrow Wilson has been accused of obstinacy, but the late Dr. Howard C. Warren, the Princeton psychologist, said he was just "extremely hard to convince once he had thought a question through and reached a decision." At any rate, the stubbornness of Winston Churchill was responsible for the terrible slaughter at Gallipoli.

Although it has been found that the negativism of early childhood reaches its low point at about five years of age, there is an intensive developing of contrariness in later life during the adolescent period, about fifteen to twenty years of age. This is generally recognized as a period when it is hard to manage young people, and they are hard to manage largely on account of this negativism. Dr. Leta S. Hollingworth of Columbia University has commented on an interesting aspect of this as follows:

"The parent who wishes to break off a growing attachment will do well to remember the added charm of the forbidden. The spirit of self-assertion is, especially in youth, closely associated with sex impulse. Clandestine love is especially attractive to the youth, apparently because spiced with rebellion against authority. Love-making carried on in the face of obstacles is sweeter to many temperaments than that carried on at the instigation of elders."

Dr. Ernest R. Groves reports, in addition, that "we find two extreme reactions. One child becomes the victim of suggestion to such an extent that he never develops, but carries through life childish tendencies and is easily swayed by his contact with dominant persons or even as a result of different forms of suggestion common to modern life such as skillful salesmanship or clever advertising. The other type of child develops into a rebel. He seeks every opportunity to react adversely. Sometimes this childhood habit extends into later life, becoming strengthened in the process. The result is an unsocial or even antisocial individual who at the least will be stubborn-minded and constantly antagonistic to social conventions."

Dr. William H. Burnham, of Clark University, says further that "some people are antagonistic to whatever is suggested—a normal attitude perhaps at the age of four. In extreme cases they oppose any plan or project, or even any statement made by another. If they are in general sensible persons and their cooperation is desired, this can

easily be obtained usually by suggesting indirectly the given plan, and when the matter comes up for discussion, waiting until they suggest the plan as their own, and then agreeing with them. Or more surely, perhaps, one can suggest the opposite of what one desires, present that forcibly and then agree to the person's negative attitude. Thus such extreme cases may be called negatively dependable.

"To test such people, to determine whether this is a survival of childish negativism or not, is easy. The test is merely to suggest a most trivial matter and note their reaction. If the attitude is a survival, the response will be negative, however trivial the matter at issue. The writer recalls such a case. If one said to this man in the morning, 'It is likely to be fair weather today,' the reply was immediate, 'It will rain before noon.' If, on the other hand, one said, 'We are going to have rain today, probably before noon,' the reply would be, 'Haven't you any more confidence in the weather man than that? There will be no rain today.' Again in discussion this objector would prove his own view by the forcible and positive statement, 'I read it in today's paper.' If your own authority, however, were the newspaper, equally forcible would be his statement, 'You can't believe what you read in the papers.'"

One encouraging aspect of negativism, is that a negativistic person is usually difficult to hypnotize—and, we might also add, difficult to like, difficult to work with, difficult to live with, as well as difficult to convert into a cooperative state of mind.

Edward VI, of England, son of Henry VIII and Jane Seymour, showed marked obstinacy in his adolescent years, and it may be just as well for the world that he died young, for his "strong-willed" obstinacy might conceivably have taken thousands of lives in unnecessary wars undertaken in opposition to the best of advice, in somewhat

the same way as the blind obstinacy of Marie Antoinette, unheeding the advice of Mirabeau, helped to bring on the murderous French Revolution.

Or consider Charles the Bold, who succeeded his father as Duke of Burgundy in 1467, in the prime of life, a man of decided promise, refined, well educated, energetic, ambitious. But his obstinacy overruled all these good qualities in the course of a few short years and eventually caused his ruin, culminating in his total defeat and death on January 4, 1477, at Nancy in a battle with Duke René. His naked body was found covered with wounds in a swamp the day after the battle.

All such strong-willed people, both past and present, whether in politics or industry, are merely obstinate; the strong-minded person is really just contrary.

Closely related is the stubborn person. Roughly speaking, about one-third of us are born stubborn, grow up in stubbornness, and die stubborn—stubborn, that is, to the point where an unyielding will to have our own way, regardless of the merits of the case, dominates and guides our actions.

Equally important and amusing is the finding that these truly stubborn folks rarely realize that they are stubborn and, if they do realize it, almost never will admit it. On the contrary, they are likely to insist that they "are that way" because they have superior intelligence or experience, or because they are stronger, better disciplined persons, or are honestly better qualified to decide things than the other fellow.

Yet an interesting thing about this stubbornness of human beings is that it has no relation at all to general ability. In other words, the great scientist, statesman, or business mogul may be quite as unreasonably stubborn as the uninformed truck driver or traffic cop. A person of any type, brain power, position, or calling, if afflicted with stubbornness to the degree of a fault, may be just as

An inventory of stubbornness

Yes No

- Are you inclined to follow new fads in fashions, even though the fad does not strike you as especially sensible?.....
- Do you pretend to like the kind of music that is liked by people you are with at the time?.....
- Did you have the reputation for being a very obedient child?.....
- When trying to decide how to spend an evening, do you usually end up by doing things, or going places, suggested by someone else?.....
- When talking to a socialist or someone of a political party to which you do not belong, are you inclined to agree with his political remarks at the time?.....
- Do you usually want to buy what house-to-house salesmen try to sell you?.....
- When you are at the movies, do you sometimes imitate the actions or gestures of the actors?.....
- Do you find it difficult to keep from giving a hand-out to almost every person that asks for it?.....
- Do you usually talk about what other people are talking about, rather than change the conversation to something that really interests you?.....
- When a salesman offers you "something just as good," do you usually take it?.....
- Do you write letters when radio programs ask listeners to write and tell how the program was liked?.....
- Are you happy working for someone else, rather than being absolutely your own boss?.....
- When a pitch man asks the crowd on the street to gather in closer, do you crowd in with the rest?.....
- In getting a book from the library or store, do you usually take one suggested by the librarian, by a display, or by a recent advertisement?.....
- When ordered about by a policeman or door tender, do you follow instructions without comment or resentment?...

Each "No" answer indicates a tendency to be stubborn. The average business and professional man has 9 "No" answers. More than this suggests one is more stubborn than the average.

argumentative and doggedly domineering as any other. Indeed, stubbornness appears in a variety of forms. The irate traffic cop, forgetting the start of the argument with the driver, because the driver gets excited and resists, may slap on a summons with a czaristic, "Is that so?" and walk out on reason and pleas, no matter how sound.

The conservative businessman, on one hand, and the wild-eyed radical, on the other, may show a stubborn tendency by arguing blindly and long after sane reason has departed from the discussion. And the college professor may show it by hemming and hawing when he is in the wrong and ponderously insisting that there is, of course, another side to all this. In every instance, the stubborn one has given up trying to solve the problem, whatever it may be, reasonably and truthfully and has just fallen back on dogged determination not to give in.

There is no one who has not run into folk who are downright, unreasonably stubborn: the domineering parent who insists on making his children do unnecessary things just because he says so; husbands and wives who will have their way, though home and marriage go by the board; the straw boss whose authority has gone to his head.

Such stubbornness is a good thing, or works well, in certain instances, as in football games, long struggles for fame, or General Grant's famous campaign which he proposed to fight out on certain lines "if it takes all summer." But, to be serviceable and effective, it must be used with intelligence; like the gas in the kitchen range it must not be turned on when there is no match at hand. For obviously no good can come, say, of a featherweight boxer's trying time after time to lick a heavyweight champion in street fights; or of the determination of one strong-willed individual, like Napoleon or Churchill, to impose his will upon the world, whether the world likes it or not; or of divorce-bug victims' being each unalterably determined to rule under the "God Bless Our Home Sign" or else bring down the sign; or of both sides' taking a licking to win a strike.

Is it not clear how such a stubborn, obstructive attitude not only may help to impede progress, defeat reasonable reform, and cause much mass suffering in political, social, and economic fields; but how, as well, it may make an individual disliked, generally avoided, and likely to be omitted by associates from projects, plans, or parties? Indeed, it is just such folks who come to be called "wet blanket," "kill joy," or something of the sort. What is more, they may never understand why, not thinking of themselves as unreasonably stubborn "pains in the neck," but, as we indicated in the beginning, as strong-willed, earnest, honest, uncompromising with evil, etc. Were there only a few such among us, they might fairly be regarded as "museum pieces" and left alone in their peculiar personal glory, yet, as we have said, the verdict is that about one out of three of us is more or less tarred with this pitch of plain stubbornness, as a rule without being aware of it.

What can be done about it? Well, we can each examine our own mental outlook and attitude, and if we do it honestly and discover that we are among the stubborn group, we can henceforth be on guard against it. This may be the means of changing one from an unconsciously obstructive, difficult person into a reasonable, cooperative, go-ahead individual, the sort of which the world has plenty of need just at this time.

There is another closely related variety, as it might be called, of human nature which is not only hard to get along with but which also undermines domestic and industrial relations. Let us take up first the kind that threatens domestic relations. It is sometimes called *bossiness*.

"There is nothing worse in this world than a nagging woman," Judge William C. Dodge called from his bench in a New York court. "Case dismissed." The case which called forth this wisdom from the magistrate was that concerning the beating of Mrs. Mary Laura Maxwell with a

shoe-tree in the sturdy hands of her physician-husband after their Thanksgiving dinner.

Nagging is gossip to one's face, which makes it a bit more decent than gossip behind the back. Still, it is annoying. Just as gossips dig their own graves by their gossiping, so do naggers dig their own by undermining friendships and by getting antagonism rather than cooperation from others.

Catherine II, Empress of Russia, gained the reputation of being the Semiramis of the North as a result of the severe nagging she received in childhood from her peevish and pedantic mother. This maternal nagging was not quite so severe, however, as that suffered by Cardinal de Bernis, the power behind the throne of more than one king of France.

In his memoirs the Cardinal writes about his childhood tutor, a man named Lejeune, "whose ill-directed piety had heated a head already narrowed by nature and education. This worthy personage made me fast on bread and water on the eve of all the feast-days, compelled me to leave half my dinner for my guardian angel, made me say my prayers four times a day with my knees on iron spikes, ordered me to wear bracelets of the same metal also spiked, chastised me, not to correct me, but to feed me with the spirit of repentance. It would have been a great crime to complain, a crime which would have been very severely punished. My parents did not know of my hidden austerities until they saw the abscesses which came on my knees and wrists."

"Anger, at last, got the better of me, and after vainly meditating various projects of vengeance, my head being full of the Comte de Cabalis, a book that I believed to be full of the mysteries of the cabala, I resolved to vow myself to the powers of hell and transform my unworthy tutor into a stone or a tree; and with this resolution I rose one morning at four o'clock and went into a solitary place at day-break; there I made my invocations and conjurations, but all to no purpose. Nothing appeared. Then, believing that the powers of darkness might appear to one more

readily in obscurity, I went down into a cellar, not without some fear. My trepidation became terror when, having begun my invocation in a loud voice, there issued from beneath the casks a big black cat, which rushed, miauing, between my legs, and which I took to be the devil. My hair stood on end and I fled hastily, believing that all hell was after me."

Very little nagging, unfortunately, has these amusing byplays, which bring to mind some of the exploits of Tom Sawyer and Huckleberry Finn in their efforts to get away from being nagged by women relatives. But old women of both sexes nag.

The serious effect of nagging on the person being nagged is not generally realized. Children who are nagged by their parents have self-confidence undermined, feelings of inferiority developed, and general discouragement aroused. Nagging has the same affect on workers.

After reviewing a case—which is not at all rare—reported by Dr. Edward J. Kempf, of a young woman who as a girl was nagged by her mother, and as a young married woman was nagged by her mother-in-law, as well, and who frequently had to be treated in the government hospital for mental patients at Washington, Dr. Carl Ramus, of the United States Public Health Service, says:

"The lessons we can learn from such a case as this are very important and helpful: First, that if young persons are continually told that they are stupid or incompetent, they are likely to become so. Secondly, if discouragement, contempt, and nagging, are kept up long enough, the victims may go insane."

Some 30 per cent of girls and 43 per cent of boys who have been nagged or punished at home wish they had never been born. Some young persons actually go so far as to try to take themselves out of an unbearable life. This was the case of fifteen-year-old Mary Thomas, who early in 1933 was taken to a New York City Hospital with a broken leg, fractured skull, and internal injuries received when she

jumped from a fourth-floor window as a result of being nagged about going out evenings.

Just a few months before Mary's four-story dive to get away from nagging, twenty-three-year-old Thomas Prendergast, Jr., stabbed his father to death with a bread knife for nagging his mother.

"My son did the right thing," said his mother. How often do workers feel the same as this mother!

The influence which the mind has on the body makes it possible for nagging, in a broad sense, to produce serious results, as the following instance in Hawaii, told by Dr. Hanbury Hankin, an English chemist, shows. "Some forty years ago, during the reign of one of the Kamehamehas, a white man who was prominent in the royal Government became to one of the kahunas an object of hatred and revenge. The kahuna announced that he intended to 'pray' the white man to death, and every day he came and stood in front of his enemy's house for some time muttering curses.

"The white man was a hard-headed and skeptical Scotchman, an ardent admirer of Robert Burns, and something of a practical joker. After a few days of the kahuna's public cursing he announced that he, too, was a kahuna, and would enter the praying contest and intended to pray the kahuna to death. Accordingly, as soon as the kahuna took up his daily position the white man would come out on his broad veranda, facing down an entrance between rows of majestic palms, and then and there begin to recite long passages from Burns, with dramatic gestures.

"A few days later the kahuna was not at his usual post, and it was learned from natives that he was in his grass hut, apparently sick. By this time all Honolulu was following the case with intense interest and curiosity, the natives very seriously, the whites with mixed feelings, but mostly skeptically. As the outcome of the contest was politically important, the white man kept up for a few more days the public farce, as it seemed to him, of daily recitations from

Burns on his veranda in the presence of a large crowd of awed natives. Less than a week later the kahuna died."



In addition to the serious effects of nagging on the person being nagged (producing usually the exact opposite of what the nagger wishes), we have to consider the interesting question of why it is that nappers are inclined to nag. People are inclined to nag, for one reason, because they are dissatisfied with their own existence; by nagging others they can make others seem to be as dissatisfied as the nagger is. It seems that misery likes to create more misery in order to have company. Dr. Abraham Myerson says, "I believe dissatisfaction is more common in women in our modern times than with men," and this may account for woman's propensity to nag.

Nagging is sometimes due to jealousy, and jealousy is, of course, just one variety of dissatisfaction with existence. The brilliant Samuel Pepys, father of the royal Navy of England, married his wife Elizabeth when she was fourteen, and until her death after fifteen years of married life, Pepys made her existence hectic by his jealous nagging. Elizabeth was faithful, and there was no foundation for Pepys' jealousy unless it was his own widespread philandering, which illustrates the fact that people who nag are usually attributing to others their own dissatisfaction and faults.

How often divorce and intolerable family relations are due to nagging, no one can say definitely, but obviously the percentage of such cases is high. Nagging may not produce divorce, but, as in the case of Shakespeare, merely cause the husband to stay away from home for extended periods. Shakespeare spent more time away from Anne Hathaway than he spent with her. In this instance it was the wife who nagged, in the case of Pepys, the husband.

Revenge is sometimes an unconscious and revealing motive for nagging. Dr. John J. B. Morgan, child psychologist

of Northwestern University, summarizes that "you can tell more about a child by what he says about others than by what they say about him." Among attitudes to be avoided if one is to have a healthy mind, Dr. Morgan places second in importance the tendency to blame others, which includes nagging.

Selfishness is another prominent element in nagging. This suggests that the nagger lacks mental stability or may be mildly psychopathic, since the late Dr. Boris Sidis, after long study of psychopathic persons, declares that their one outstanding symptom is extreme selfishness.

Dr. William McDougall, Duke University psychologist, thinks that nagging "is probably in most instances the consequence of having been unduly and unjustly subjected to censure in early youth. Such experiences often repeated set up a self-defensive attitude which continually seeks to lay blame on others in order to prevent it falling on oneself. In other cases the roots of the trouble may be guilty complex; a repressed memory of some really blamable action or tendency that has remained secret and unpunished."

Many people who nag do not realize that they are nagers. They like to think they are firm, critical, good disciplinarians. They may think they are merely critical about the coffee, not realizing that they are really nagging the cook. If you catch a cold, they say you should not have been so foolish as to go out last night. If you slip on a banana peel and break your leg, they say you really should look where you are walking.

Sometimes, of course, nagging arises from incipient or approaching insanity as is believed to have been the case with Mary Todd, wife of the martyred president Lincoln. Perhaps no more touching story is to be found, among all that illustrate this subject, than that of Lincoln watching the beautiful, bright wife of his choice fade into a querulous, whimpering, anger-swept, fear-filled, nagging woman; but he bore it as he did all trouble with nobility and fortitude of the highest order.

The cure for all this? Naturally, in cases such as that of Lincoln's wife, such cure as there may be can rest only in the hand of experts of medical and mental science; but for the rest of us, we can go a long way by considering at the close of a day, say, or of a series of days, our actions and remarks to associates, friends, family, etc. How many remarks of ours have been honest, straightforward, considerate, and helpful? And how many have been critical, carping, and bitter? Of these last, how many sprang from honest judgment of the other fellow, and how many from causes within ourselves, having nothing to do with the case, so far as the other fellow was concerned?

Such a survey, recorded if you will in writing, will show you many things about yourself. You may be surprised to find that you are or have recently become a nagger, and you may with the suggestions in this brief story come to see why. Knowing why is practically all the battle, provided you realize that being just and kind to others brings the only real happiness after all, and provided that you really want happiness.

Nagging and bossiness are pretty similar. The really high-grade boss, however, is not nagging but is friendly. Recent work in one of the large factories of the Western Electric Company proved that people worked much better, and turned out more production for the boss who was friendly, than for the bossy boss who nagged his workers. Women, in general, may not make such good bosses as men, probably because of a greater tendency to nag people. This latter fact gives a reason why a mother-in-law joke is really no joke. Even Queen Margaret, consort of Louis IX of France, was nagged by her imperious and royal mother-in-law during both the courtship and later married life.

Dr. Stanley D. Porteus of the University of Hawaii, recently returned from a psychological expedition in which he studied the aborigines in the interior of Australia, gives

the following account. It shows how even the primitive mind considers nagging a pretty serious thing, as indeed we all should. "A few months before we visited Beagle Bay one of the natives had struck his wife with a boomerang which cut the jugular vein, and she promptly died. The excuse for this attack given by the murderer was that his wife 'All the time growlem,' and this his extreme provocation, added to the fact that he had not meant to strike her in the neck, seemed to be held by the rest of the natives as sufficient justification for the deed."

This native's defense probably expresses the exact sentiments of workers laboring, in shop or store or office, under an officious boss who does not realize that in fact he is a nagger.

CHAPTER 10

THE BOSSY AND THE INTERFERING

"I never give an order," says Alfred P. Sloan, Jr.

But the "times like these" that everyone talks about may more or less secretly and under cover, so far as you are concerned, turn you into one of the most troublesome, trouble-making, and trouble-inviting human types known to psychologists—the man or woman who, regardless of right, sense, or situation, is determined to be boss. This may happen, unless you are on guard. Just what this transformation, should it occur, might mean to you in home wrecking, friend losing, and enemy making, only a celestial adding machine could compute.

That such a process is abroad in the land and making progress excellent from its own standpoint, no newspaper reader, to say nothing of the teacher, the preacher, and the scientific observer, can deny. Not long ago the late Senator Huey P. Long, the Louisiana Kingfish as he styled himself, attempted to boss the United States Senate by talking for some three days; and no less enlightened a man than Nicholas Murray Butler, president of Columbia University, brought out a many-pointed program which he insisted would solve the world's now too well-known difficulties, and which he likewise insisted should be followed. From almost every point of the political compass, the good citizen hears continually bossy voices bellowing at him that he should, had better, or must do this, that, or the other.

Yet while Mr. Citizen is, after all, protected by distance and circumstances from these more important would-be national bosses, he is by no means so fortunate when it comes to similar bosses, or bossy folk, all around him. May-

hap wife or hubby succumbs under home difficulties and decides she or he will run the ship from this time on. Or neighbors rise up and tell a man he cannot auction off the farm on which he has had a long unpaid mortgage, even though he needs the money to get food for his stomach.

If he is an employee, his employer goes Stalinesque, so to speak, and tells him he will work so many days a week or not at all. Or, the penniless old friend whom he has been supporting out of the generosity of his heart through the so-called crisis may suddenly decide, as actually happened to a certain friend of the writer the other day, to tell him not only how much he ought to be giving to the charity patient, but how he could change his methods of business, if necessary, to get the extra money.

This "boss bug" that's going around is really a most interesting critter, and for years scientists have been trying to pin him down and examine him thoroughly. Not long ago, S. I. Radina, the Russian psychologist, perhaps stirred by one of the most seriously affected victims, his fellow countryman Stalin, studied hundreds of babies to determine whether human beings were not sometimes born with this bug in their figurative bonnets.

He found that about 14 per cent of babies by the time they are a year old are thoroughly inoculated with the "boss bug." In other and more scientific words, they are illogically determined to rule or ruin. But he also found that most of them, indeed all but a percentage so small that those included may fairly be called abnormal, got over it rapidly, the percentage figures being 6 per cent of four-year-olds, and only 3 per cent of five-year-olds. This suggests plainly enough that persons born bossy and remaining so straight through the years simply have not grown up as they should.

Conceding, then, that only a very few of us are born "bossy," it is surely in good order to observe more closely how the bug gets hold of some of us well along in life and makes us bossy adults. In a word, when a person is dis-

satisfied, when he has failed to attain whatever goal he has set for himself, or when he has lost his fortune, business, or job, he is ripe for the "boss bug." The bug looks him over, at least so it appears, and if he is a sound-minded, naturally hard-working fellow who can readily adjust himself to new conditions and start over again from where he is, why the bug just leaves him flat, which of course is a most fortunate thing.

But if he is one who gives way to worry, one who just cannot "see why this happened to me," one who dwells on the "unfairness of it all," and who cannot get used to the newly curtailed income, the cut-down in comforts or recreations, the cheaper clothes, food, *et al.*, then the bug bores in and takes charge. That state of mind might be said to be his most preferred field, but not far behind in desirability in the "boss bug's" policy is that other interesting human condition popularly termed the swelled head.

How the "boss bug" seems to love a good swelled head! And for some mysterious reason he seems to prefer women to men, at least according to Harry W. Hepner, Syracuse University psychologist, who after a research among 1,000 folk selected as a fair section of the populace, reported that 8 per cent of the men and 17 per cent of the women admitted being "boss-bug" victims. Not in those thoroughly un-university words, naturally; specifically, they admitted that their worst and most troublesome characteristic was the uncontrollable habit of being dictatorial.

Consider, then, what happens to the dissatisfied, unlucky individual when bitten by the bug. Thinking quietly and cooperatively, with an eye to the other fellow's needs and necessities, becomes more and more difficult under the pressure; and finally the stage is reached where he or she gives way to emotional forces. These men and women then no longer think of the other fellow, nor of anything but what they themselves want done. The other fellow won't give in to their way of doing things; therefore, they allege, the other fellow is a fool, crook, or something of

the sort, and must be made to comply by any means at hand.

Violence being seldom advisable, the bug-bitten ones drive on to results in downright bossy orders and ukases, "You will do this," and "You will do that, no matter what you think about it." Or they rant and harp and argue on the least provocation, riding down other people with what might be called conversational hobbies, such as the inevitability of technocracy, whatever that may really be, or the value of balancing the budget, or whatever is uppermost in their minds. Folk with bad attacks of bossiness are quite simply and single-mindedly determined to make others do, think, and even feel as they, the bug-bitten, want them to, willy nilly.

To continue our figure of speech, when the "boss bug" creeps into a fine swelled head, it appears to use another technique. Naturally, it puts the spotlight upon the victim's good position, success, intellectual achievement, etc., and subtly suggests something like this: "See, you are all right, you are getting along splendidly. All around you are folks who are beaten and helpless. How come? Surely you must be stronger, more intelligent, or something than they. Ah, but the herd is pretty dumb after all."

After a little of this kind of cerebration, you are just naturally giving these stupid ones orders, advice, counsel in much the same manner that you might a dumb animal. No question of suggesting or talking things over; simply the word handed down from Mount Olympus.

The "boss bug" gets all kinds of persons, such as the elder J. P. Morgan, "Morgan the Magnificent," who bossed everyone, even at family picnics; and Bernhardt, "the Divine Sarah," who ruled servants, lovers, roués, and royalty, with the most petty and czaristic bossiness. Yet ridiculous as bossiness is in the great, it is far more amusing in the small, who have nothing but an inflated ego, without any real basis of successful achievement.

A serious peril to government in a democracy is that people who want hardest to be elected to high office are most likely to need a psychological investigation of the inner state of mind which makes them so overeager. The college professor who pulls strings for years to try to become college president belongs in the same group of psychological suspects. A deep source of our modern educational incompetency is the unfortunate truth that those who work hardest for the office usually get it.

The man who has to be implored, against his wishes, to head the business or the institution or the government is the man to put your money on, when you want a really constructive job done. The others—those bending every energy to get on top of the heap—may kick up a lot of dust if they get on top, but their influence is almost invariably demoralizing. Dust does not mean progress. And the chief result accomplished by the bossy is heaps of dust.



Now, some of these attacks are only temporary; and it is a poor soul who cannot sympathize with a healthy burst of direct, active bossiness on the part of some formerly hard-working, sensible fellow who has not been able to get a job for three years, or some businessman who, with taxes, price drops, credit difficulties, labor troubles, and what not, begins to feel somewhat like a fellow being bound with cords against his will. Their behavior seems but human; and yet the truth is that bossiness is, without exception, about the worst way, short of violence, in which to get anything done by others, changed by others, or accepted by others.

If you are inclined to doubt this, consider the findings of Ethel M. Riddle, psychologist, who at Columbia University made a study of bossiness among a no less typical American group than poker players. She discovered a group of five students who had played poker together for two years or so at the university. They agreed to play for the

benefit of science as well as for pleasure. So the woman scientist harnessed them with apparatus for measuring respiration, heartbeats, and other excitements of the great American game. To make the test more complete, she even induced the lads to play for higher stakes than usual. The limit was twenty-five cents instead of ten. Big stakes, more heartbeats and heavier breathings!

Now, this is the enlightening and astonishing thing which the unique research developed. To win at poker, don't be bossy and don't try to run the game. If you do, the psychologist discovered, you simply rouse antagonism and concentrate the fire of the opponents on yourself rather than on the others. Because your bossiness rankles, the other players come to feel a greater satisfaction in beating you than in beating anyone else. The more you fight and strive to get the better of them by browbeating, arguing, demanding game changes, and such stratagems, the more they want to beat you. They minimize your bluffs by staying in hands they otherwise would have dropped out of in the hope of "taking you," and for the same reason they direct more bluffs at you, feeling that in putting one over on you they would get more downright satisfaction than in doing the same to the comparatively humble and meek pasteboard juggler on your right.

As Dr. Riddle says, poker players invariably are more eager to win from the aggressive bossy player than from the submissive ones, except of course in the case of sharpers who in businesslike fashion prey upon the gentleman by preference.

But not long ago, there came to the writer's attention a case demonstrating this truth among the most publicized poker players of our day—none other than the well-known Thanatopsis Club, whose leading lights are Heyward Broun, columnist; Franklin P. Adams, columnist; and Alexander Woollcott, man of letters. It seems that an editor from what Broadway calls "the sticks" dreamed of getting into that game. He played in the games among

the boys on his paper back home, and being the boss, ran the game with a high hand, winning consistently, of course.

Finally, according to my particular gossip, he prevailed upon Broun, to get him into the big game, and he showed up with about \$2,000 most of which he had won back home. In his heart he expected to show the New Yorkers some real poker and make a killing. Soon, he was deep in the play, and unconsciously there came into action all the bossiness that went so well in his personally conducted game at home. One by one he had all the great figures of the select Thanatopsis gamble watching him and bent on beating him, and in the end they took him for \$5,000 odd.

Now whether or not poker playing may be taken as a small replica of business affairs, the fact is that the same law as to bossiness holds good not only in business but in every other human field. The wise men who compiled the Bible had an inkling of this, no doubt, when they wrote, "Blessed are the meek, for they shall inherit the earth."

How often do we hear the pack exult when some shining business or social mark comes a cropper! Not long ago, I knew a firm man of undoubted talent, prodigious ambition, and comparable energy. He was engaged in the newspaper business; but after twenty years he found himself out of it, his life disorganized, and his prospects hopeless, at forty. True, he may make a new start and come through with flying colors; it has been done, but the chances are against it. Why did he, with all his undoubted and roundly praised abilities, get nowhere? In his own words, for one reason: that he had been bitten early by the "boss bug," and his challenging, dictatorial attitude alienated probably 90 per cent of all those with whom he worked. As I heard a friend of his say, sympathetically rather than critically, "He's so d—cocky, you can't help but feel that you'd like to see him knocked down."

But these people who are, so to speak, habitual back-seat drivers, whether the vehicle being driven is ward politics, a church meeting, or the ship of state, usually are so wrapped up in their own ideas of their own merit that they fail to foresee how they are defeating their aims of controlling people and events. The small-time bossy person, for instance, the one who has to eat his humble pie at store or office during the day, but who returns home of evenings to boss the children and browbeat his wife, should understand that the second most common cause of marital unhappiness and infidelity is just such browbeating; and that hundreds of children run away from home each year because of overweening bossiness by one parent or both. Many farm children have gone to the city, apparently because of a better chance to earn a living, but in reality to get away from some such tyrant in the farm home.

Those in high places seem just as much in danger as lesser men of being bitten by the "boss bug," and when this happens whole nations, rather than a few lives, are wrecked. Kings may rule their families in the same domineering way. Some of them in the past have coldly and cruelly bossed the affairs of state. Consider the little-known way in which the Emperor Joseph II of Austria appointed Count Collorado, with a staff of two adjutants, to control every activity of the life of his son, Prince Francis. The Emperor gave the Count a detailed syllabus of twenty-five precise articles covering everything the growing boy might do. Little wonder that when, twenty-four years old, the Prince became Emperor Francis II and ascended the throne of the Apostolic Caesars, he was timid and ill at ease. Never before in his life had he been allowed to make a decision, and the remainder of his life, largely in consequence of the "boss bug" of his father, was one of pitiable weakness, losing first his country to Napoleon, then losing his daughter Marie Louise to Napoleon as the little corporal's second bride.

Whether they are kings or those in the bread line, the people who are at heart not certain of themselves get the worst bites from this bug, aver the psychologists. It is the mother-in-law who secretly recognizes that she did not treat her daughter as she should who raises most disturbance about the way the husband is providing. It was a relatively unaccomplished wife, Xanthippe, who scolded and bossed the great Socrates. We can understand why the sons of Socrates were described by contemporary historians as "dull and fatuous."

Wherever you find people having trouble in getting along, most always you will find that a large part of the trouble is due to someone's having been bitten too acutely by this "boss bug," whether it be labor leader or industrial magnate. If it is not one person who has had a severe biting that causes the discord, then it may be a host of people who have been given a nip or two by the bug. When a church is having trouble over a minister, when high school or college students go on a strike, when families land in the divorce court, when the city council is having a big fight over nothing—then look for those who have had a bite or two by this mythical but very real bug, and you will usually discover the persons who at bottom are to blame for the trouble. For, regardless of their good intentions, bossy folk stir up trouble just as readily as grape juice works without yeast.

So beware of the "boss bug." If it gets you, that is, if you get an inkling from others that it has bitten you, sit down and analyze yourself to see just how bossiness works in your case, whether you are mentally domineering, in other words a loud-mouthed arguer, or an unsympathetic order giver, or some other kind of "boss." Then simply decide you'll go and sin no more. If you do this, you'll be taking stones out of your daily path, making your own way easier and in the end more lucrative and profitable, and you'll find yourself infinitely more popular and happy.

Prohibition is repealed, but no law can repeal the "prohibition" state of mind which was basically responsible for the amendment, which is always with us, and which even now strives here and there to clamp other legislative prohibitions upon us.

As a psychologist, the present writer views the "prohibition mind" as by far the most interesting of all the startling brood forced into the spotlight by the great "dry" hen. It is like one of those fevers of the body which are capable of developing into a plague; indeed, it is a kind of psychological plague. As a doctor diagnoses the fever in the body, so can the psychologist spot the "prohibition mind."

The symptoms in the individual are these. The victim, if you please, works always under a sustained, powerful emotional intensity. Mere mention of the object of his or her particular pet prohibition calls into play not intelligence and reasoning powers but on the contrary emotional denunciation, argument based upon feeling rather than fact, and protesting demands. Almost invariably, while under this malign influence, the patient is distrustful of others and at the same time is apt to be given to encouraging gossip, slander, and even hate. He is ever ready to forget the best and believe the worst. He is inclined to place more faith in causes, as such, than in human beings and leans toward mysticism and sentiment as opposed to logic. In this emotional condition, afflicted with a basic lack of self-confidence, he usually endeavors to make up for this lack by becoming boastful, conceited, dogmatic, and oracular.

Before we get down to business cases, let us mention some famous "patients." Could there be a better illustration of this psychological illness—for that is what it is—than that of the late William Jennings Bryan at the famous "monkey trial" in Tennessee? There, in spite of all his ability and undoubted intelligence, he attacked emotionally, unreasonably, and vituperatively all science, even to the

extent of urging that it be outlawed, because of the acceptance by scientists of the now well-proved doctrine of evolution. What of Carrie Nation smashing saloons? What of Stalin, Napoleon, Mussolini, Hitler, Anthony Comstock, or Martin Luther, each in his special field boastfully and relentlessly enforcing his will and convictions upon fellow men by denunciation, verbal abuse, imprisonment, and killings, as the case might be?

Indeed, even a cursory reflection upon these powerful personalities shows at once the overwhelming emotional, as opposed to intellectual, drive under which they all labor or once labored. Likewise, such reflection cannot fail to recall to the most hasty student many instances of hatred, bitterness, slander, distrust, and abused power on their parts. No doubt, too, the reader can think readily of persons among his own acquaintances who by possession of similar dominant emotional traits and tendencies either have at some time or other typified the "prohibition mind," or still do so.

Only the other day, the writer was confronted with a highly personal example of how "prohibition mind" comes upon a person. Asking after a long unseen friend, he was surprised with the answer, "Oh, he's gone nuts about great fortunes. Can't talk of anything else. Wants them prohibited. He argues like a candidate, on the slightest excuse. All abuse and little sense, too. Talk about a bore!" And this friend used to be as sweetly reasonable as a philosopher. *

Now, considering that since time immemorial reason has been accepted as the best guide to conduct, wherefrom stems this evil—"prohibition mind"? Is one born with it, or is it akin to a psychosis or disease of mind that comes upon one much as does a fever? The bulk of psychological evidence is that it develops as a result of experience in life and is not inherited. Significantly enough, none of the world's outstanding prohibitionists have passed their "prohibition mind" drives on to their children.

For example, the son and daughter of William Jennings Bryan, compared with their famous father, are as sweetly reasonable as contented children. Napoleon, that matchless "prohibition mind," remade much of the political world by laws and regulations against whatever brooked his enormous desires, but his son was so mild an individual, so willing to live and let live that, I venture to say, most folk never even heard of him.

As psychology demonstrates, the beginning of "prohibition mind" can be traced back on the one hand to emotional experience of fear, despair, hatred, envy, jealousy, resentment, anger, or the peculiar emotion of sadism; and on the other hand, curious as it seems, to such opposite emotions as love and pity. Indeed, "prohibition mind" may be said to be that mental state where emotion becomes the substitute for thought, first as the reaction of some strong emotional experience and then perhaps habitually.

Thus, there are persons who think objectively and soundly upon all but one subject; when that one comes up, however, their emotions take control of their thinking. Likewise, there are others in whom this substitution becomes more and more pervasive until it controls the whole action of their brains. In other words, in such extreme cases, the person never actually *thinks*, but merely *feels*. Now, with intellectual judgment and reason lost to them, what is left? Unable to meet problems with calm reasoning, analysis, and planning, what have they to work with? Only force, the ultimate weapon of emotion.

Absorbing, indeed, is the consideration of these life experiences which may be taken as the major cause of "prohibition mind." Broadly speaking, they may be classified under the headings of failure, fear, and revolt. As to the first, consider a young college graduate, a friend of mine, who entered the ministry. His first pastorate was in a big city slum. A kind, sympathetic fellow, he was appalled at the evils of drunkenness among his flock—broken homes, sorrowing wives, hungering children. He

labored desperately to win the drunkards to sobriety by persuasion, logic, and example. He worked mightily for civic action to clean up the saloon. But it seemed to him that the harder he worked, the more lush were the weeds in the vineyards. His pity for the people and a personal sense of failure preyed upon his mind.

He despaired finally of ever meeting this problem by reason, and out of his hopelessness came the conviction that only force could ~~quash~~ ^{oust} alcohol. Once won to this belief, he ceased to think at all about alcohol as a problem; rum was indeed a demon to be exterminated at any cost. To my amazement, not long ago I heard him with eyes afire advocate the use of the army to eradicate liquor, and the "chair" for bartenders. I did not even trouble to point out that such measures, in all reason, could but bring upon us evils even worse than those born of the saloon. He was beyond reason in the matter. I could only hope that in time he might get over his severe attack of "prohibition mind."

Now, in much the same way failure to achieve objects produces "prohibition mind" toward other things. There are many men who, failing to win riches for themselves, are overwhelmed with bitter envy toward others who have done so. They come to suspect the rich, to believe that no man can honestly achieve great wealth, and in the end to urge the prohibition of fortunes. Others, failing to make friends among their fellows, turn to dogs for comradeship, to all intents and purposes prohibiting so far as possible human beings from their lives.

Of the manner in which fear may develop "prohibition mind" two examples from my personal observation are available. The first is the case of a man who for years was a secret drinker and finally, as a result, faced financial and professional ruin. He tried desperately but could not break the habit. Out of his despair and fear grew the idea that if liquor were prohibited for everybody, he might be saved. Was liquor bad for everyone? Was universal pro-

hibition feasible? He would not even listen to reasonable talk but could only exclaim, "No, no, liquor must go," and unnerved by his excitement, repair to his liquor closet.

What prohibiting minds work at in the present time:

- prohibit war
- prohibit conflicts
- prohibit strikes
- prohibit drinking
- prohibit smoking
- prohibit overeating
- prohibit stale air
- prohibit eating meat
- prohibit dissection
- prohibit capitalism
- prohibit vice
- prohibit obscenity
- prohibit cruelty to animals
- prohibit cruelty to children
- prohibit politicians
- prohibit motion pictures
- prohibit teaching of evolution
- prohibit democracy (Hitlerites in Germany)
- prohibit socialism
- prohibit white bread
- prohibit standing armies
- prohibit starched collars
- prohibit education of women
- prohibit tabloids
- prohibit gambling
- prohibit lotteries

Doubtless, there were and are many like him, as there are like my second friend who does not drink but is an ardent liquor prohibitionist. This man, in whom our common human aversion to changing old habits is abnormally strong, has an almost pathological fear of anything new—new laws, new inventions, or even newcomers in town. The curious fact is that, while he emotionally opposed the 18th Amendment, he stormily opposed

changing it. Indeed, "prohibition mind" has become so inclusive with him that prohibition is his only answer to such questions as radicals, Russians, bank control, new roads, practically everything. Indeed, were it possible, he would prohibit all change.

Some typical prohibiting minds:

Stalin
William Jennings Bryan
Hitler
Sumner
Dwight L. Moody
Mussolini
Carrie Nation
Comstock
Napoleon
John Roach Stratton
Luther
Woodrow Wilson

Even more numerous are cases of "prohibition mind" belonging in the third group, that is, growing out of revolt. First, there is the gnawing discontent often encountered among the poor and unfortunate. Swept by bitterness and disappointment, many a man has become an ardent prohibitionist, against liquor and other things, because when he himself is not able to enjoy night clubs, champagne, and other luxuries, he grimly *feels* that others also should be deprived.

Some, again, in the same position, being naturally sadistic, find positive pleasure in the thought of the pain or unhappiness inflicted upon others by prohibition.

No doubt, too, the stark monotony of farm and tenement-house life has developed in thousands, even millions, feelings of envy, jealousy, and hatred which prevent them from thinking even half clearly. In other words, it has given them the grimmest of prohibition minds.

Again, we find countless folk who, restricted in childhood and youth by ill health, by domineering and even cruel

parents or kinsmen, or by a too rigorously repressive religious atmosphere, come to manhood with an ingrained dominant inclination to put similar restrictions upon others. In this class must be included the old Puritans, the ethics of whose faith was "thou shalt not."

We have spoken of "prohibition mind" as a psychological figure. And so it is. Always in the citizenry there are persons *predisposed* to join in a prohibition movement, regardless of the wisdom thereof or of what is to be prohibited, because of emotional attitudes induced in them by fears, failures, poverty, or life experiences of the types enumerated above. They but wait opportunity to exercise their various prohibition "drives," just as so many did when the war, by making curtailment of the use of grain for beverages seemingly logical and necessary, as well as by exalting the idea of mass action, efficiency, and discipline, over all other considerations, gave them the liquor-prohibition standard to rally round. Just so tomorrow, continuance of the depression, by making confiscation of wealth seemingly necessary to prevent starvation, may give them another rallying point—the prohibition of great fortunes, or even of private property. As history proves, the balance between intelligent control and emotional control is always fine, and it needs but a slight shift in life conditions to bring emotional control to headquarters.

Yet, fortunately enough, such prohibition hysterias, which are really fusings of countless personal "prohibition drives" into one movement, always tend to destroy themselves. In the first place, it is an undeniable fact that such unreasoning prohibitions, unreasoning as differentiated from laws against murder, for example, go directly counter to the most deeply imbedded trend innate in mankind, a trend which, as science proves, man evidences in his crib before he can do more than whine—his desire to be free. In the long run, no prohibition program born of emotional

"drives," bitter or otherwise, can stand against this drive for freedom which is more a matter of intelligence and intellect than of emotion.

Not least interesting is the curious fact that once a mass prohibition "drive" has come to power, the individuals whose personal "drives" united to bring it about begin to turn against it. The satisfaction they got from it fades, yet their original emotional impulses are still with them; they want something new to prohibit. Sometimes, they would prohibit the movement they lately joined. Witness, for example, the number of former liquor prohibitionists now fighting as stanchly with the anti-prohibitionists. They are now bent, in effect, on prohibiting the prohibitionists from prohibiting.

That is why people "with a mission" are failures in adjusting industrial troubles. They have, in a way of speaking, an ingrowing boss bug. But the list of those hard to get along with is not by any means exhausted.

CHAPTER 11

SOME MORE WHO ARE HARD TO GET ALONG WITH

The simple word "I" is the word most used in telephone conversation.

Showing off, in its various indirect and disguised forms, is so common that for years the technical term "exhibitionism" has been applied to it. It is a part of our narcissistic self-love, named from the beautiful Greek Narcissus, who paused over a spring to get a drink of water, saw his reflected image, fell in love with it, and tumbled admiringly into the pool, only to be drowned. Fortunately for hordes of us, not all showing off ends so tragically.

The incessant questioning of young children is more to get attention—to show off—than it is to satisfy curiosity. The show-off spirit is also shown in the way children butt into the conversation, turn somersaults, or cut capers of some kind, when the preacher calls. And how about adults? The ultra-important foreman and the workman always asking advice are but two examples among scores.

There is a more subtle and less direct expression of showing off in childhood, such as wanting to get high marks in school for the parents to brag about to others. In this way exhibitionism at times produces desirable results in childhood. How about craft pride among adults?

On the other hand, it produces unhealthy results in childhood when boys have poor deportment marks due to their showing off in school. At times it may lead even to committing crimes in order to show off. The criminal has this human trait to a high degree, as we shall see.

The average child is strongly exhibitionistic through the first six or seven years, and in some cases exhibitionism

seems to hold this childish level of development throughout life. As a rule, however, the show-off tendency among adults is most marked in those folk who fear themselves, who lack confidence, and who show off to try to get back their self-respect.

For illustration take second lieutenants as presented in this story. A private in France during the war saw a soldier in khaki passing and called out, "Hey, buddy, give me a light." The soldier accosted stopped and held out a lighted match. Raising his eyes to speak his thanks for the favor, the soldier saw the star of a brigadier general and at once apologized, "I beg your pardon, sir; I did not mean any disrespect, but I did not notice you were a general." "That's all right," replied the general, "but you should thank God that I was not a second lieutenant." The story could just as well have been about the straw boss.

The show-off streak in some people makes them especially suited for certain occupations. Modiste's models, actors, preachers, hotel doormen, bathing beauties, demonstrators in show windows, and Sally Rand are presumably those with strong streaks of exhibitionism. Some actors and actresses dress flashily off the stage for the same reason. Gangsters are often betrayed and caught as a result of their desire to show off in public in flashy clothes in company with a beautiful moll, or to visit the scene of the crime and show off their knowledge of the details. Bragging about their tough jobs has jailed many crooks who furnished no other clues. Rudolph Wadsley's weakness for flaming neckties led to his ready capture and his arrest only a few hours after the crime, for holding up Edwin Kohler in Chicago.

Direct body exhibitionism, which is psychologically called infantile, makes some persons more than willing to pose in the nude for sculptors, or to do the strip dance in the burlesque, or to join a nudist colony or the Doukhobors.

Even royalty is included, as in the case of a queen of England who posed in the nude for an artist and was asked

by a member of the court upon first viewing the painting if she had not been uncomfortable while posing. The Queen responded, "No, there was a stove which kept the studio warm." Then there was the Empress Theodora, the Byzantine Princess who was the wife of Justinian, the Roman Emperor. Small, slender, graceful, of pale complexion, and with wonderfully expressive eyes, as a young woman she is said to have danced naked on the stage and gained fame through the silent abandon of her exhibitionistic dancing.

The possibility that body exhibitionism is stronger in women than in men is shown not only by the contour-and flesh-revealing vogues in women's dresses, but also by the great increase in the number of beauty parlors and in the sale of cosmetics. It took the speediest crinoline girl fifteen seconds to undress, while the modern girl can shed her clothes in three seconds flat.

Equally obvious to those with a little psychological insight is exhibitionism shown in the effort to use big words, to talk about trips abroad, to dress flashily, to go to all possible public gatherings. Reckless driving, confessing to crimes not committed, talking about personal poor health, bragging that one does not care about etiquette, all reveal the show-off just as truly as do the obvious examples of Sol Bloom's nautch dancers at the '93 World's Fair or Minsky's burlesque queens on Broadway. Grover Whalen, Jimmy Walker, Odd McIntyre reveal exhibitionistic tendencies in their dress, just as Marlene Dietrich and Aimee McPherson show exhibitionism in other ways. Then there is the former farm boy who uses big words, or the Nebraska schoolteacher who eternally talks about her trip to Europe. There was the regal splendor in which Florenz Ziegfeld lived, even engaging a private railroad car when almost penniless. It helped to make him preeminent as a theatrical producer of gorgeous exhibits.

The use of excessive trappings at funerals unwittingly reveals the show-off in yet another way. The silver coffin of the gangster is just one illustration. The same tendency was shown when the wife of the factory worker bought new curtains for the parlor after realizing that her husband was about to die. Expensive wreaths, elaborate mourning costumes, and other displays of this kind are usually motivated less by respect and affection for the deceased than by this tendency to show off.

The Emperor Charles V, who ruled over the Netherlands, Burgundy, Spain, Austria, and much of what is now Germany and Italy, had a strong streak of indirect exhibitionism. In the last days of his life he actually rehearsed his own funeral to be sure he would have a grand one. He had a great and solemn procession, "catafalque and all, and, kneeling in front of the altar, handed to the officiating friar a taper, which was symbolical of his own soul."

Americans have learned so well how to show off at funerals that late in 1929 the English Undertakers Association sent a delegation here to find out how we do it.

One of the virtues of the amazing tendency to show off is that it makes folk work harder in a group or when people are going to know how well they work than when they are working alone and others will not know how well or how poorly the work is done. Drs. P. A. Sorokin, Floyd H. Allport, L. E. Travis, Paul R. Farnsworth, and Horace B. English, are a few of the scientists who have shown experimentally that the presence of an "audience" makes people work better. Exhibitionism as a general trait cannot, apparently, be condemned in the same way as contrariness; we can condemn exhibitionism only when it works to corrupt morals or to produce such results as elaborate funeral displays, getting up parades without any need for them, using big words, and other useless forms of drawing attention.

A number of aviation accidents are due to the show-off. So are many industrial accidents.

Reckless driving, especially by people under thirty, is due in fully half of the cases to this show-off tendency. Many other foolish and reckless stunts, such as flag-pole sitting or marathon dancing, are also due directly to show-off desires.



A test for the reckless show-off—trying to balance a four-foot rod on a dime. The show-off lets go of the rod quickly, overconfident that it is balanced. (*Test from Dr. Harold E. Burtt.*)

While the young man may risk his own life in a roadster to show off, the older man may show off with unnecessarily elaborate entertainments, yachts, imposing lodge regalia, or parades.

And, after all, why should they not? As Dr. Margerie Van de Water says, "Psychologists have found that one of the first traits displayed by the young infant is the desire for attention. Probably nature has given this longing to human infants as a substitute for the ability to shift for himself which is the gift of the young of the lower animals."

Showing off, as Dr. Van de Water says, is one of the first traits we exhibit after being ushered into the world; she might have added that it is also one to which our friends and relatives will give rein for us when we are finally lowered under the sod.

While a few people go completely nude to show off, many more "doll up" for the same reason. In this manifestation of showing off, men seem to be just about as

active as women, even though the men start with the handicap of more bodily awkwardness and less luxuriant complexions.

Recall, for the minute, Oscar Wilde and his famous black velvet suit. So notorious did this become that when he was scheduled to lecture at Boston a group of Harvard students aped his customary dress and paraded into the hall attired in knee breeches and silk stockings, carrying oranges in their hands.

Disraeli's vest buttons attracted almost as much attention in his time as a round-the-world flight does today. He went further than vest buttons and acquired an embroidered Andalusian jacket in which he went visiting; he left Malta dressed like a Greek pirate, and from Turkey wore a turban. Dressed in a black velvet coat, poppy-colored trousers, and a scarlet vest, and wearing his rings on top of his gloves, he visited Caroline Norton.

George V of England had a dragon tattooed on him, and his cousin Czar Nicholas II had one on his arm. Not to be left behind, Queen Olga of Greece also had her anatomy decorated with a tattooed dragon.

The French actress Georgette Leblanc, Maeterlinck's wife, always dressed like some painting. One day she would appear on the streets and in the drawing rooms as a Rubens Virgin, another day as a van Eyck picture, another as an allegory by Memling. One winter day in Brussels she was on the streets in an amethyst velvet dress trimmed with gold braid, followed by a long train with which she swept the cobblestones clean, and all topped off by a hood of fur. Amazing as such a costume was, it accomplished more than just to satisfy the urge to show off. Wherever she went, others dropped aside to gape at her and gave her a clear path ahead.

Our own America provides equally interesting instances of overdoing the show-off in dress. Berry Wall, the "King of the Dudes," could express this trait in clothes, and started the battle of haberdashery. Senator James Hamilton

Lewis is as sober as a tomb in comparison with the dudes of a generation ago. About that same time, a student at Oxford by the name of Mahatma Gandhi was given the nickname of "Gandhi the Dandy."

Jim Fisk in the seventy's paid off all the debts of the Ninth Regiment so that he could wear a resplendent colonel's uniform and lead their useless parades. A short time later he became "admiral" of the miniature Narragansett Steamship Company, and every afternoon when he watched his boat leave the pier he displayed himself in admiral's uniform, with a huge diamond sparkling inappropriately on his shirt front.

Jim Brady, a contemporary of Fisk's, went in more for diamonds and gawdy jewelry than for military and naval splendor, although it has been said that he did manage to keep from wearing earrings or nose rings. Brady also showed off at the dining table, and that was the beginning of his end, for it was more than even Johns Hopkins Hospital could do to keep his stomach running successfully against the handicap of his living up to his reputation for eating at least three times as much as a normal man. At the old Waldorf, for instance, it was not unusual for him to eat, alone and at one meal, two dozen large Lynnhaven oysters, two dishes of green turtle soup, two portions of terrapin, two whole ducks, and two or more desserts.

Enormous meals and huge jewels were not possible, however, for Timothy L. Woodruff, so he showed off in another way, and became lieutenant governor of New York on the basis of the color and variety of his vests, which for years eclipsed the colorful splendor of Easter eggs.

Perhaps even a gorgeous assortment of striking vests is not possible today for most of us, but that does not keep us from showing off in less obvious, but still evident, ways. In fact, no handicap keeps us from showing off. We may think it is our love of the beautiful or of the modern, but, honestly now, isn't there just a little bit of showing off in it?

Still, as we have said, this is not altogether a bad thing, this exhibitionism from which, in one form or another, we all—or nearly all—either suffer or profit. We work better and are more generous, adventurous, and interesting because of it. But on occasion exhibitionism drives a person into dire acts. Some boy, for example, kills because he cannot see any other way of getting the means to show off among his fellows—as Bert Arnold killed his grandmother because she would not let him take her automobile on the night of a party. Even so, since we are all exhibitionists, conscious or otherwise, it would seem to be sound humanity for us all to have a little more sympathy than we usually do for the exhibitionism of the other fellow—the pole-sitter, if you like, or the matron who loads her obese and failing body with diamonds and jewels, the father who brags about his first-born, or the worker who wants to do the best job in the entire shop. We might at least notice him and give him any words of praise that are merited.

In human nature, there is but a step between showing off and snobbishness, although the former, as we have seen, is useful if properly handled.

A snob, the dictionary says, is a person who has a false sense of superiority and who regards wealth and position more highly than character. The importance of knowing whether you are a snob or not becomes evident when the wide and pernicious influence of snobbishness is realized, not only in individual lives, but in social, business, educational, and political circles as well.

Notable among research workers who have studied snobbishness are such well-known scientists as Dr. William McDougall, of Duke University; Dr. Floyd H. Allport, of Syracuse; Dr. E. S. Bogardus, and Dr. Carl Ramus. Not only do they cite glaring evidences of snobbishness in everyday life about us—instances, for example, of persons, individually and en masse, selecting friends,

political leaders, business associates, and employees for such qualities as wealth, manners, birth, family, education, club memberships, and social connections, rather than for honesty, executive ability, technical knowledge, and above all, character,—but they reveal, as a result of psychological research among college students, figures showing clearly just how surprisingly widespread snobbishness is among us all. College students almost always reflect the attitudes and opinions and standards of the homes from which they come; for that reason certainly no better group could have been selected for the purpose.

It is, then, upon the outcome of these researches into the attitudes of college students that the estimate of 60 per cent is based. At first thought, many persons may be inclined to consider that college students are likely to be more snobbish than the general run of human beings. But a modicum of consideration ought to furnish a sufficient answer to that objection; and a perusal of the newspapers should clinch the argument.

Only the other day, the writer was amazed and amused to see in the *New York Times*, for instance, an advertisement for "a genuine nobleman," who could prove the validity of his title, to serve as a host in a "high-class" New York night club. In other words, behind this advertisement was a shrewd entrepreneur who judged that a titled European would attract more trade than would an untitled American, regardless of the latter's character, personality, charm, or experience. There were, he sagely concluded, enough snobs in the world to make the employment of "a genuine nobleman" a paying proposition. The point is, of course, not that a nobleman may or may not be a fine, able fellow, but rather that nobility of birth should be made a main qualification for employment.

However, before examining more exhaustively snobbishness in everyday life, and before summarizing psychological thought as to what makes snobs of so many of us, let us consider the unbiased verdict of the investigators. Certainly

the most extensive and enlightening test was that conducted by Professor Allport. For his subjects he had the entire student body of Syracuse University—some 5,000 young men and women from every part of the nation, the sons and daughters of the rich and the poor, of the educated and the uneducated, of Republicans, Democrats, Catholics, Protestants, and indeed of every other conceivable group.

Now, Allport found that, regardless of intelligence, character, good or bad fortune, personal charm, or integrity, 85 per cent of the 5,000 students would not live with Japanese, Chinese, Turks, Greeks, Armenians, "Bohemian" folk of easy morals, Bolsheviks, anarchists, or Negroes. What is more, 75 per cent would not be seen with persons shabbily dressed, no matter who or what they were; and 71 per cent would have nothing to do with families of social standing less than that of their own families.

The questions used were quite specific; the students were given to understand their import and had every reason, so far as could be assured by approved scientific practice, to understand them. Thus, when they answered that they "would not live" with "those races and types enumerated above, they understood that they were making race a primary and all-important factor upon which to base their selection of associates. The words "live with" were used, as they knew, to imply ordinary association, such as dwelling in the same rooming house, club, or home. The Chinese in question might be as intellectual and as spiritual, as noble and lovely of character as Confucius; the Negro as fine a character as Booker T. Washington; but none the less the students with this bias would always consider color as a bar to social, everyday equality. The Bolshevik might be, personally, as Christlike and as honorably and charmingly companionable as you please; but they would not dwell in the same house with him, let alone be friends and be seen with him. As for a shabby, down-at-the-heel fellow—whether he were an artist of

world repute in hard luck, or a former New York banker and victim of the crash—no, they would not consort with him nor be seen in his company, if they could avoid it. Quite openly, in other words, did they admit that they considered wealth and position to be above and beyond character and personal worth, and that they would make this a principle of their lives.

Even more interesting, perhaps, were the figures for different classes of students. By far the highest percentage of persons holding such views—in other words, let us say, of snobs—was found among the members of college fraternities. Incidentally, this group placed smaller emphasis on the value of good serious work in college than did the other groups, and thought cheating in examinations less serious than did the others. Twice as many of these as of any other group admitted cheating in examinations. The group containing the next highest percentage of those holding snobbish views was made up of students in home economics, all women.

The group containing the third highest percentage was composed of those taking business courses, while the group which included the lowest percentage was made up of students doing graduate work in such courses as philosophy, law, and medicine. In other words, women are more snobbish, as the dictionary defines the term, than are men; fraternity members more snobbish than other folk; and the further one goes in his or her studies, and the wider becomes his intellectual grasp, the less snobbish he or she becomes. Strikingly significant, indeed, seems this last clearly indicated deduction.

In view of these revelations, it is to be wondered at that we read of the night-club employer putting “a genuine title” above character and experience, untitled charm and personality? Is it any wonder that we see, as we did in 1928, an outstanding American statesman denied voting support by thousands because he was born on the East Side of New York, because he made mistakes of grammar

and pronunciation, and even because his sterling-characterized wife was too fat? Or that we see Henry Ford, with hundreds of competent former employees waiting to be called back to work, finding a place in his organization for a nephew of the deposed king of Spain? Or the *Harvard Crimson* recently advocating that all men who must work their way through college be barred from entrance? Or American women spending much time and money each year for the empty honors of being presented at the Court of St. James's? In short, is there, can there be, any question that the percentage of those who make wealth and position rather than character the supreme test for friendship, advancement, public office, and even employment, in the general run of Americans is commensurate with that found among college students? In any case, it is a fact that the Syracuse findings have been borne out by the other similar researches mentioned in the beginning of this story.

We find Dr. Wayland F. Vaughn, of Boston University, saying, "We make too much of position in the social scale; to rise in that scale is, no doubt, very gratifying and a proper ambition; but to sacrifice all happiness, ease, contentment, and even more important things, to that ambition, *as so many do*, is foolish in the extreme."



Under the psychological microscope, this so prevalent quality of snobbishness shows some very interesting characteristics. For example, its origin in the generality of cases is not at all what a good snob might think, and one may become and continue to be the most objectionable kind of snob without knowing or realizing it. Curiously, almost invariably do the most snobbish pride themselves on not being snobbish at all; true, they say, they think themselves better than many persons, but they contend that they *are* better, and demand, in effect, "How can that be set down as snobbish? That is simple truth."

*Earmarks of snobbishness**Yes* — *No*

- | Do you smile and feel pleased when you notice someone else making a mistake in grammar or etiquette?.....
- | Are you inclined to be bossy or officious to shoe-shiners, conductors, filling station attendants, and others of the same sort?.....
- | Do you enjoy talking about the private lives of well-known people?.....
- | Do you have a preference for movies, plays, and stories of high society?.....
- o you try to get on friendly terms with the boss, policemen, or other officials?.....
- Are you cautious and slow in getting acquainted with people who are not "big shots"?.....
- Do you discard clothes not yet through with their usefulness in order to get more stylish clothes?.....
- Do you give more attention to the finish and appearance of your automobile or watch or other possessions than you do to their mechanical care?.....
- Do you dislike to be with people who wear shabby clothes?.
- Would you dislike living with an anarchist or with a Bolshevik?.....
- Would you be unwilling to share your home with a person of another color?.....
- Do you try to be with people who have more money or prestige than you have?.....
- Would you dislike living with a "Bohemian" person of broad or loose morals?.....
- Would you dislike being seen in a rattletrap auto?.....
- Do you feel uneasy among people of a different religion than yours?.....
- Do you like to be with people who have more education than you have?.....
- Do you dislike being seen with "queer" or unusual people?
- Do you follow the etiquette books closely?.....
- Are there some people with whom you went to school, but whom you avoid now?.....
- Do you like to tell about various places you have been?.....

Each item answered by "Yes" is a sign of snobbishness. The average business and professional man has 7 "Yes" answers. More than this indicates a tendency to be snobbish.

But bearing that in mind, consider now how—on the average, of course—a typical snob may be brought into being and continue. Unlike poets, snobs are either born or made. In the first instance, that of birth, it is clear that a human being born and brought up in the snob's creed that he *is* better than other folk will adhere to that creed, especially if he belongs in a rich, well-placed family.

It is interesting to see how snobs are made by life. To begin with, the widest base for the building up of snobbery in a person, boy or man, is not a conscious feeling of superiority, but an unconscious feeling of inferiority. Growing up, the victim finds himself failing in tests of intelligence, ability to get ahead, making friends, or competing with others as student, orator, or what not. What can he do? Of course, here and there is an exceptional person who sees truly his failings, ascertains the real reasons, and laboriously sets about building up personal qualities of mind and heart by which to better his ability, his capacity for making friends, and his ability to concentrate and learn. On the contrary, the more common reaction to this is for the self-dissatisfied one to seek short cuts to self-importance. In other words, it is more common for mankind to seek the easiest way.

The dissatisfied one will probably go about getting himself elected to a certain club, or, failing that, forming a club of his own. Likewise, instead of conforming to others' standards of personal value, he sets up and fights for standards of his own. What he has, or has the capacity to get, that is the best thing in the world, and the thing all men should strive for. Honorary titles, entrance into select—so-called—social groups, appointive offices, good clothes, etc., are the easiest things in the world to get; easiest, that is, in comparison with trained mental ability, technological excellence, firm and disciplined character. So the self-dissatisfied fellow, gaining these lesser things and seeking always to make them seem important, gets an air of false

confidence which, because it is false, is always more arrogant than any real confidence ever could be.

Here, then, you have the snob. As he goes on in this way, he comes to believe unquestioningly what he preaches and lives by; indeed, continually bolstering his belief and persuading himself, he even comes really to believe himself better than other folk because of the exaltation of his own false standards. It is no wonder, then, that he inculcates these standards in his progeny. Perhaps, nothing makes the whole analysis clearer than to recall the utter disregard of geniuses like Edison and Einstein for such things as society honors, position, or badges of honor, and to set over against this the pride and pompousness with which many an industrious, dull little man labors to get on committees, to appear before the public, and to crowd into society.

The explanation of the comparatively marked snobbishness of women hinges on this same question of inferiority feeling. They are subject, of course, to the forces suggested so briefly in the discussion above; but in addition they have another difficulty with which to contend. For centuries, say the scientists, through social and political organization men have endeavored to force upon woman a belief that her sex was, in truth, inferior. So she has had even more reason than man to entertain a sense of failure; and when she, individually, happened to be born with the kind of make-up that seeks the easiest way, she naturally went at it with even more intensity and earnestness, on the average, than did the opposite sex. And so, when she is a snob, she is inclined to be a better, more wholehearted snob than her mate. As to this, Dr. Vaughn makes a most interesting observation. He says:

“The eagerness for good social standing, as it is called, appears in its greatest intensity among those sensitive individuals who feel their station and who need privileges to bolster up their self-respect.” And women, beyond doubt, are the more sensitive, and more introspective than men.

No doubt snobbery works great harm upon us all. In the snob himself, it blocks growth and limits achievement because, self-persuaded of his own superiority, he makes no real effort to improve his talent or character. He neglects his mind and often his soul, until he becomes little more than a gilded human dud. And in its effect upon the snob's fellow men, just how much bitterness, disillusion, conflict, and even crime has been caused by the actions of snobs in applying their false standards to the lives of their fellow men, collective and individual, it would be difficult if not impossible to overestimate.

Now we shall turn to something practically universal in human nature which will throw much light on the business problems arising from the show-off and the snobbish streak.

CHAPTER 12

CAN THE ORDINARY PERSON'S JUDGMENT BE TRUSTED?

*Oh wad some power the giftie gie us
To see oursel's as ithers see us!
It wad frae monie a blunder free us,
And foolish notion.*

—ROBERT BURNS.

When the Scottish poet Burns wrote his famous lines, he suspected what science has now definitely proved, that most people think too highly of themselves. Of course, the loud-mouthed, conceited braggart is easily discovered; but it turns out that the quiet, demure person also usually overestimates his or her virtues and underestimates the bad qualities.

Science has devised a simple mirror which fairly well reflects the distorted notions that the individual is likely to hold of his qualities, good or bad, and the more accurate picture presented by the estimate of more unbiased observers.

To a marked degree we are all more or less like Narcissus, the beautiful youth of mythology, who, we recall, on seeing himself for the first time as he leaned over a clear pool to drink became so enamored with himself that he forgot to maintain his balance on the brink and, falling in, was drowned. Deluded by our false high opinion of ourselves, say the scientists, we frequently attempt things beyond our capabilities and so topple into pools of disappointment and failure.

Illusions as to personal beauty are common enough. History tells of many women and men of very plain features who could not see their own ugliness. Now and then a

woman is found who has no illusions about her lack of beauty. Thus Mlle. Polaire, the French actress, recognized and capitalized her ugliness, emphasized it in every way, and made a stage success by declaring herself "the ugliest woman in the world."

Egotism is a common fault, and the former Kaiser has been pointed to as the most egotistical man of modern times. Only recently he has been quoted as saying that in looking back over his life he could not see that he had made any mistakes, and if he had his life to live again, he would do exactly as he had done.

"Beau" Brummel, on the other hand, was justified in his sense of superiority over other men of his time. Few people in fashionable British society took a bath at that period, and they covered up the odors they carried about with them by heavy doses of perfumes. Brummel knew he was right when he persuaded his contemporaries to take baths now and then, and to wear clean clothes. But when the late homosexual Harry Lehr introduced new fashions and monkeyshines into Newport society, he was widely laughed at as a clown.

The ways in which we are blinded by this misleading and inherent self-love make a most interesting story, revealing a great deal about our personal lives and fortunes which we ordinarily might never realize. By no means the least astonishing part of it is how this self-love of ours, without our knowing it, extends its deceptive influence over our opinions of our friends and even of our material possessions. For the psychologists marshal an impressive array of evidence to show that just as we minimize our own faults and exalt our own virtues, we similarly think over well of our friends' or relatives' abilities and tend to excuse their faults, and that in the same way we usually come to believe our own automobile, radio, company, college, or other possessions to be the best, regardless of truth.

The psychologists do not deny that this has its good as well as its bad side. They point out that it is what makes for

the loyalty that brings support and progress to cities, business organizations, and nations; but on the other hand, they say it makes for prejudice, conflict, unfairness, cruelty, and war. If everyone could judge himself and the other fellow impartially, what a host of misunderstandings, quarrels, disappointments, failures, and bitterness might be avoided. Yet most folk, according to the scientists, though absolutely honest in intent and absolutely convinced that they are being fair in their judgment of themselves and their friends, are almost always wrong.

One of the most ingenious proofs of this puzzling pudding lies in experiments conducted by Dr. Henry L. Hollingworth, of the psychology department of Columbia University. Now, since it would be extremely difficult, not to say impossible, to get any considerable number of folk to agree, for example, as to who was the most refined, the most vulgar, or the most handsome human being in the world, Dr. Hollingworth devised a scheme of comparison among groups of people which enabled him to watch their judgments of themselves and others in action, much as our judgments are to be observed in action in the everyday business of living. Fortunately, it was a judgment test that anyone can use for himself, as will be shown later. Though the groups involved did not know it until afterward, the professor arranged things so that he was aware of just who prepared each set of judgments. They thus made judgments of themselves and of others, just as we do every day.

For the first of these tests, the professor selected a group of twenty-five persons well acquainted with one another, if not all friends. These folk were asked to rate the whole twenty-five of their number as to these qualities: refinement, humor, intelligence, sociability, neatness, and beauty, as well as for conceit, snobbishness, and vulgarity. They were to put down as No. 1 in refinement, for instance, the member of the group they held to be most refined. If one held himself to be first in that quality, he was to put down his own name first and then grade the rest as No. 2, No. 3,

and so on. If they individually judged someone else to be first, others No. 2, No. 3, and so, and themselves No. 13, for example, they were to set these judgments down in that order. Since they believed that the statements were for general anonymous statistics, and that no one ever would know the identity, all boldly proceeded to make the record.

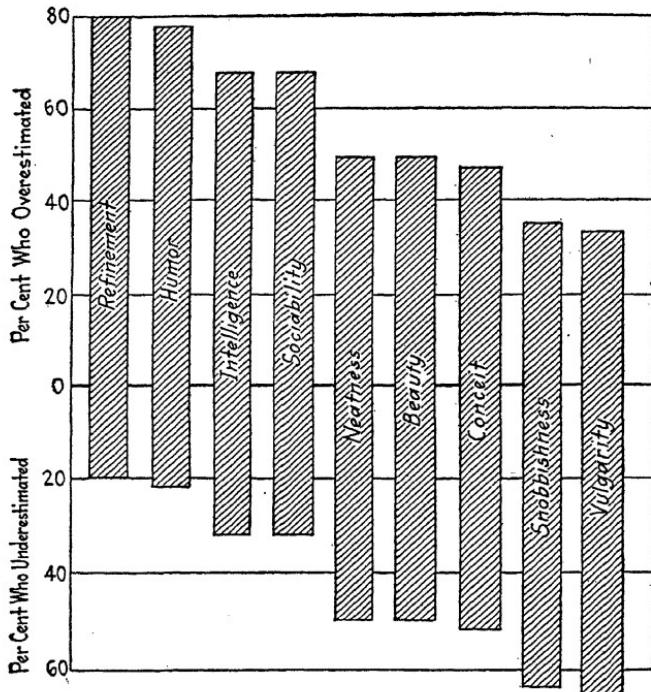
That done, the psychologist and his assistants were in a position to average up the results and find out precisely the opinion of each one of the twenty-five as to his own refinement, etc., compared with the average opinion of him as to the same qualities held by his friends. On a small scale, this was, in fact, like a comparison of self-opinion with world opinion of the individual. How often do we wonder what others really think of us! All sorts of startling variations were revealed. One who thought himself near the top in refinement was in the average view of his companions below the twentieth. Another individual who took great credit for being humorous was in the eyes of the others about as humorous as the late Carrie Nation. But the nuggets of universal value lay in the averages, of course, rather than in the individual cases. Here is a summary:

As to neatness, the average judgment of self in the scale or list of twenty-five numbers or ratings was 5.8 numbers *above* the average combined judgment of the others; as to intelligence, 6 numbers above; as to humor, 7.3 above; as to beauty, 6 above; as to refinement, 7.2 above; and as to sociability, 5.4 above. As to snobbishness, on the other hand, the average judgment of self was 5.1 numbers *below* the average combined judgment of the friends; as to conceit, 5.7 below; and as to vulgarity, 6.1 below.

In other words, as a general thing, these twenty-five educated and intelligent humans beings, giving their honest judgment of themselves and their friends—under the rose, as they thought—estimated themselves higher in generally desired qualities and lower in generally despised ones

than they were shown to be in the opinion of their companions.

The sleuth of science was not content to rest there. He proceeded to make the same test over again, this time with fifty people. The results were a verification of the



How it is human to err in favor of oneself. This is a graphic representation of Dr. Hollingworth's findings.

first experiment, 80 per cent overestimating their degree of refinement; 78 per cent, their humor; 68 per cent, their intelligence; 68 per cent, their sociability; 50 per cent, their neatness; 50 per cent, their beauty: while 52 per cent underestimated their own conceit; 64 per cent, their own snobbishness; and 66 per cent, their own vulgarity. And what was more, in the cases of beauty and neatness, where the number overestimating and underestimating them-

selves was equal, the extent of overestimation was markedly greater, on the average, than that of underestimation.

Indeed, so clearly indicative are the results, that the conclusion might be taken as showing an average general figure measuring the usual human bias with regard to these particular qualities—this general figure being, on a basis or scale of fifty numbers, 6.3 over estimation for refinement, 5.2 for humor, 3 for intelligence, 2.2 for sociability, 1.8 for neatness, 0.2 for beauty; and 1.7 underestimation for conceit, 2 underestimation for snobbishness, and 4.2 for vulgarity. Or, to put the thing more succinctly, the average human being may be said to overestimate his own refinement by about 6.3 numbers on a scale of fifty, and so on for the other qualities; and to underestimate his own vulgarity, for example, by about 4.2 on the same scale.

All of this means that while there are persons who may be only one number off, say, in their ordinary self-judgments, there are others perhaps twelve or even twenty off. While it is true that these tests cover only certain qualities, the figures are certainly fairly indicative of what may be expected of the average self-judgment on other qualities.

Not long ago, as an instance, a young mechanic appealed to me for help as to how he might become a lecturer on philosophy. He had a weak voice, an uncertain manner of speech, and a totally unimpressive presence. These alone were enough to defeat his success in the new field, in all probability; but when I pointed all this out to him, he protested vigorously. He actually believed his voice, speech, and presence to be adequate, and he was eager to spoil a good mechanic to make at best a very mediocre lecturer.

Now consider the curious way in which this human tendency to exalt our own good qualities and minimize our bad ones extends to our friends, as experiments conducted by Dr. Frederick B. Knight at the University of Iowa

demonstrate that it does. These experiments showed that almost invariably human beings believe that their fathers, for example, or their friends are more refined, less vulgar, more intelligent, or less stupid than they actually are.

"And why not?" the layman may exclaim at this point, "Certainly such an attitude is natural enough!" And so it is. But that does not make void the fact that as a result of this overestimation or underestimation, as the case may be, relatives and friends are sometimes put into jobs or urged into enterprises for which they are by no means fitted, and so are doomed to failure and disappointment that may, conceivably, discourage or embitter them for years.

Presenting the other side of the case, the Knight research shows that, as a general thing, a casual acquaintance is better able to size up one's traits and qualities than is a close friend or kinsman. The reason is, of course, that in the judgment of friend or kinsman the old handicapper, self-love, will get in the way. Your friend or your relative is, in the mysterious processes of the mind, somehow a part of you; any disparagement of him is therefore a disparagement of yourself, and you proceed to defend or uphold him in the judgment. Whereas the casual acquaintance is free from the handicap and therefore can make a free judgment, on the basis of fact.

The same thing, curiously, holds true when we come to judge our possessions. These material objects, through association and use, seem to be extensions of our personality, as the psychologists say. They become all tangled up in our minds with our own ego. To possess good things inflates our ego, or gives us a good opinion of ourselves; to possess bad things reflects unfavorably upon us and our judgment. Thus we make excuses for them, according to psychological principle, and kindly ascribe virtues to them. Even a secondhand car becomes to its owner not just another secondhand car, but one of the best ever turned out of its particular factory. And probably the car owner is hard to find who has not falsely proclaimed the record

number of miles his car will make on a gallon of gas, or the amazing mileage it has achieved without repair.

In still another way, according to numerous psychological experiments, is our judgment of ourselves and of others unbalanced by self-love. Suppose that we are born with or develop some particularly striking ability, such as musical, legal, forensic, or inventive talent. This gives us, naturally, a sense of power and capability, and unless we are very sure-minded and intellectually honest we are apt to imagine that we are exceptional persons all around, and that *all* our traits and abilities, refinement, neatness, etc., are of the outstanding variety. It does not take a psychologist to point out many persons in the public eye who, because of outstanding success in business, authorship, or invention, obviously think themselves authorities in politics, sociology, or statesmanship.

Look back to the ratings, "How do others see us?" in Chapter 8; and be yourself, if other people will stand for it.

That gives us a basis for understanding some things which have both puzzled and annoyed businessmen for years.

The observer sees around him on all sides startling evidence of exaggeration: in salesman's talk, politician's claims, newspaper write-ups, conversations from barroom to bridge table. Recent experiments by psychologists shed much light on just how prevalent among us is this inability to tell the truth about self, as well as on why all but a few of us are incapable of telling the whole truth about ourselves. Naturally, there are numbers of instances—innumerable instances, we might say—wherein we lie about ourselves and our capabilities in order to gain some financial, business, or other advantage, but that is not half the story. For science traces the universal impulse to such exaggeration into far more obscure and fascinating phases of our lives.

How often when talking to friends, acquaintances, business associates, etc., do you have cause to think such things as "He's exaggerating," or even, "What a blooming liar he is!" Curiously enough, people frequently in speaking of self blandly give themselves credit for things to which the person to whom they are talking knows they have no right. Such instances seem incredible because one thinks, "Why, he must know that I know he's not telling the truth!"

Statistics show that experienced employment agents should make a practice of discounting about one-fourth of the claims of applicants for jobs.

Americans think that English humor is dull and pointless. Englishmen think that much alleged American humor is not humor at all but simply "droll exaggeration." So this possible national trait of exaggeration shows itself even in our humor. But we have a good precedent: Christopher Columbus was practically a pathological liar.

Mark Twain learned the formula for his humor when he was a boy. He was then a sickly weakling; and when he was not shunned, he was pestered and plagued by his Missouri playmates. Even his mother joined in "picking on him." If anyone ever had reasons for developing an inferiority complex Mark Twain did.

But as a young boy, he suddenly learned that instead of being plagued he was admired, and instead of being shunned he was sought after, if he exaggerated enormously and deliberately in telling about commonplace things; simple events he would relate with a great deal of dressing up, as though they had been bizarre and exotic, referring, for instance, to the casual visit of a neighboring farmer as the arrival of the king with his suite.

Precisely, this was not lying, since the exaggeration was so marked and so impossible that anyone could see through it, and it was done deliberately for effect. Later, he made use of this very same thing in his humorous books, which

became remarkably popular, apparently not only because we are a nation that likes exaggeration, but because we are a nation of exaggerators par excellence.

Perhaps we are a nation of exaggerators because, being in a relatively new country, we worship the large and the big somewhat as we worship the old. Large fortunes, the tallest building, the largest ship, the hottest day, the biggest cake in the world, and similar things so appeal to us that they make news, although there is admittedly little of national importance in the fact that the Washington apple-growers send the White House an apple pie that is six feet in diameter and a foot and a half deep.

Another, and a more important, reason why we exaggerate so is that in the United States, as probably nowhere else in the world, the spark of ambition has been kindled to such a degree that it is commonly held to be a personal disgrace not to have followed the path from log cabin to the White House, or from section hand to railroad president. It is probable that this spark of ambition has been kindled into too large a flame for most of us, but that is another story.

For the present, it is enough that this spark leads most of us to wish to be more important, more educated, more wealthy, more athletic than we really are; so that most of us *when we are away* from home and friends exaggerate our attributes, and some of us exaggerate them even when we are right *among* our friends, who know at once that we are not merely exaggerating but are telling lies.

It is very common for people to exaggerate their education, because the notion has gone abroad in this country that everybody should have a college education. Since most of us cannot have one, some of us try to give the impression that we have. The impression may be given mildly and to some extent indirectly by using college pennants for decorating homes and windshields; yet this is really deceit and lying.

An exaggerated impression of one's education is responsible not only for a show of interest on the part of people

who have never been to college in college athletic teams, but also in attendance at college football games. As a rule, more than half of those who attend a college football game have never attended college. They go to the game, not always so much out of sheer enjoyment of the game as to be able to say to their friends for the next month, "How well the team played!" or "We've got to get a new coach."

Direct and undeniable lying about education is also common. Of course, we think at once of the illiterate person, usually colored, who pretends that he can read and write. But more significant than this is the fact that there are hundreds of thousands of persons in United States pretending, at least when away from home, that they are high school graduates or college graduates when they really left school in the seventh or eighth grade.

There are thousands pretending, some even when they are at home, that they are college graduates. A taxi driver in New York told me recently that he was a Colgate graduate, although it turned out that he thought Colgate University was located at Jersey City. A matronly floor clerk in a Boston hotel recently told me that she had attended Colgate, although Colgate has only men students.

Even accomplished and capable men who have had considerable success sometimes pretend that they are college graduates when they are not. Some time ago, I was talking with a successful advertising man who held an important position in the Middle West, a man considerably older than myself, who had me convinced that he was a graduate of another Eastern college. Some time later, I accidentally learned through his wife that he had never been to college, but that he had read everything he could get hold of about the Eastern college which he pretended he had graduated from. I think that his wife did not know half of his pretense. An important chain-store executive, also, for years gave me the impression, and still continues to give the impression,

that he graduated from a certain college, although I have since found out that he merely attended high school in the town in which the college is located.

Exaggeration about one's finances is also common. A few years ago, people bought pianos, on installments, not always because they were interested in music but because to have a piano gave them a certain financial class. A few years ago, too, people bought, also on installments, more expensive automobiles than they could afford, because they had the impression that a car would set them in a financial class above a larger number of people than a piano would. During the war boom, bricklayers bought silk shirts and went without coats in chilly weather so that people could see the expensive shirts. This was not so much vanity as actually lying about clothes.

Installment buying made it possible for people to exaggerate their apparent wealth and so capitalized this human weakness, besides making the depression a bit more depressing. In a very real sense, this sort of lying helped to prolong the depression.

Athletic abilities and personal strength are other qualities that are exaggerated on every hand. Old men tell about feats of strength which they "used to do in their youth" but which probably they have never done except in their aging imaginations. Many boys now at college pretend in letters to their parents and to girls that they are on athletic teams, and when at home wear sweaters with athletic insignia which they are not justified in wearing. The tremendous interest in athletics, both amateur and professional, comes to a large extent from the fact that in this great New World not only do we have financial and educational opportunities but that the country is peculiarly adapted to the development of strong bodies. A large percentage of regular hangers-on at Olympic and other contests are self-conscious weaklings who are exaggerating their own athletic strength by a consuming interest in athletic performances.

Persons of real achievement are likely to be unconscious of their own education or money or the recognition of their own ability. They do not have this motive for exaggeration. Thomas A. Edison turned down offers of honorary degrees from many universities, both here and in England; and while the ordinary person is often eager to frame and exhibit a cooking-school diploma, and some even go to the extreme exaggeration of buying a fake diploma, we find that Edison paid little attention to important credentials and citations, many of which he actually mislaid and lost.

People are also inclined to exaggerate their importance by mentioning well-known personages as though they were on good terms with them. In its milder form this shows itself by trying to get a close-up view of a returned aviator, of the President in church, or of some financial genius at a public meeting, and from then on talking of the appearance and mannerisms of the famous person as though they were in a more or less intimate relationship with the notables.

The extreme form of this common failing is found in the exaggerating nuisances who pretend that they have committed crimes and who, through their concocted confessions of things that they did not do at all, believe they will make an impression of being bold and brave. Pathological liars are still claiming that they kidnapped the baby Charles Lindbergh. This sort of thing happens after every notorious crime. Lying in its most brazen form!

In contrast with the above, however, is the report on 8,446 persons who took the United States Civil Service examinations in New York City and vicinity one year. All of these swore that they had no criminal records, yet fingerprint experts found that 181 did have criminal records, and undoubtedly others had records with the fingerprints missing. This is discussed in detail in my book "The Psychology of Selecting Men."

The American bent for lying shows itself early in childhood, but this is due largely to the fertile play of imagination rather than to anything else. Children not only may imagine

that they see elephants and play with elephants in their backyards, but they may tell their parents about them.

Try answering these

Yes No

- Were you better than average in school?.....
Can you outrun most people of your age and weight?.....
Are you able to "outsmart" a traffic policeman who is calling you down?.....
Have you ridden eighty or more miles per hour in an automobile?.....
Do you know why Shakespeare wrote the play "Much in Little"?.....
Do you understand in general what the reciprocal tariff means to world nations?.....
Do you carry more money in your pocket than most people who are in the same work?.....
Do you know the general purpose of the ignition compensator in automobiles?.....
Do you have some memory of May Irwin's song, "It's Over All"?.....
Do you have some idea why Cleopatra murdered Mark Anthony?.....
Do you think you remember events better than most people?.....
Do you know why one's ears burn if someone is talking about him?.....
Do you know how study develops a high forehead?.....
Do you believe you are quicker than most people to catch a joke?.....
Do you relate instances of wise comebacks you have used to win arguments?.....
Do you sometimes tell others about the things you are going to buy, even though it will be some time before you will buy them?.....
Do you always tell people exactly what you think about their choice of clothes, their judgment in buying a secondhand car, the conduct of their children, etc?.....
In telling friends about things you have bought, do you like to state the price a little higher than it was?.....
In relating an argument you were in, do you like to dress up the account to show up to your advantage?.....
Do you sometimes let others get the impression that you have had more schooling than you really have?.....
Do you tell people you were too busy, or had a headache, or something of the sort, to get out of doing something that you simply do not want to do?.....

It seemed best not to mention until the questions had been answered that these are designed to reveal the all-too-human tendency, speaking mildly, toward exaggerating. The "Yes" answer shows such a tendency in most instances. The average business or professional man has seven "Yes" answers.

In such cases, it is unwise to punish the child as if he were lying. If it is noticed at all, it may be simply accepted with

some remark pointing out that it is fine to be able to imagine things so well. Children sometimes have imaginary playmates. The little daughter of Dr. John E. Anderson, of the University of Minnesota had an entire family of imaginary playmates, the "Brown" family, including an imaginary father and an imaginary mother as well as several imaginary children.

Mark Twain's acquired exaggeration, which will be recalled, led him as a newspaper correspondent in a mining camp to send out unfounded stories about nuggets as large as mules. It is still common, however, to find that the fortunes reported by newspapers to have been left by important men often shrink enormously when the coin is actually counted.

In January, 1923, for instance, headlines told of a man who had left one hundred million dollars and a fifty-word will; in July of the same year the same newspaper reported that he left seventeen millions. Albert W. Atwood has found instances "where a rich man's estate has been overestimated 1,000 per cent in the newspapers. It is exceedingly common to estimate such properties at twice their value. The newspapers in their guesses doubled the estates of Henry C. Frick and William Rockefeller, both of whom were so enormously wealthy that exaggeration should have been impossible."

We sometimes lie unconsciously, just to be interesting. Professor William McDougall says: "There is a form of insincerity which is also a form of egotism and consists in exaggerated expression of our feelings and overstatement of our opinions. This fault springs from the desire to make ourselves more interesting to others. We should let our expressions correspond exactly with our sentiments, not only in kind but also in degree; to diminish or exaggerate by a voluntary effort the natural intensity of our expressions is to be dissimulate. Even when our sentiments are entirely kindly and our intentions honorable, exaggeration of expression is still a mistake and a fault. Nothing is more

easily detected than the note of insincerity, and a little exaggeration may make our expressions altogether suspect."

Dr. Katherine M. Murdock, using tests of lying and exaggeration, has found that 99 per cent of Oriental children surpass the average Anglo-Saxon in honesty, in freedom from exaggeration in their statements. As Dr. Gardner Murphy comments on this, "The point is, of course, that Occidental children learned very early what ambition means, and that in some situations all is fair."

Professors H. Woodrow and V. Bernmals studied overstatement in children not yet of school age by asking if they could write their names, turn a somersault, stand on their heads, count up to ten, and so forth. They found only one child who understated what he could actually do. Five-year-old children said they could do 75 per cent of the things, but actually could do only 50 per cent. Four-year-old children said they could do 51 per cent of the things, but actually could do only 30 per cent. This tendency, not to be held in the same class as imaginary playmates and similar things, shows the early beginning of the tendency to exaggerate, a tendency which is more marked in Anglo-Saxons than in Orientals, as Dr. Murdock's findings show.

Drs. Mark May and Hugh Hartshorne, who over several years made an elaborate study of exaggeration and other forms of deceit, have found that a person may exaggerate or deceive in one thing, but not in others, or perhaps not in many other things.

Just as an adult will cheat a railroad but not a poor person, so an individual may exaggerate about his education but not about his income. What he does exaggerate about, therefore, is especially significant as showing the inside cracks in his character. If he exaggerates about one thing, it does not necessarily mean that we should expect him to exaggerate about other things, except in the case of a few persons who have been so completely twisted by their ambitions that they are properly called "psychopathic liars."

Drs. May and Hartshorne also found less tendency to lying and exaggeration in people with more brains, but keep in mind that even the brainy will exaggerate if their ambitions have been thwarted. The same investigators report that going to Sunday school does not help, so far as they could find out, in keeping people free from exaggerating.

Experienced employment agents discount as much as one-fourth of the things that applicants tell them they can do. This streak of exaggeration is so marked that during the World War it was necessary for psychologists to develop "trade tests" to find out what men could really do before artisans were selected from among the draftees.

The credit manager will always have an important job. The next chapter may be of help to him especially.

CHAPTER 13

HOW TO TELL WHEN SOMEONE IS LYING

With a tendency to exaggerate, even though slightly, in one's own favor widely established as practically a human trait, the topic of more-than-usual exaggeration is but a continuation of the surveys we have just been making.

Exaggeration so downright and so serious as to constitute lying has some peculiarities. There is no generalized trait of truthtelling, for instance. The person who is absolutely honest in one thing, or in most things for that matter, may be deliberately and consistently deceitful in some other things. The man who would not let the newsboy lose a penny in making change will gloat to himself over having been able to cheat the railroad. The man who deliberately lies to get rid of a salesman may be the soul of honesty in dealings with his own customers. And so on, lying is specific, not generalized, for most persons. As a rule, people are not either entirely truthful or entirely deceitful. They may lie in some things and not in others. The practical task is to find out whether they will lie, or are lying, in the things which to us are crucial.

That is why a single test to find out whether a person is generally honest or not does not work satisfactorily. Psychologists have developed many tests of honesty, but the above fact gives the tests limited usefulness, for the person may cheat a psychologist just as he would the railroad company, yet be rigorously honest in most other things. So a test, such as letting a person score his own test when no one is around watching, but with a telltale paraffin coating on the back revealing later every alteration he made to help his score, does not tell much about how honest he would be with the firm's funds.

Yet sizing up deceitfulness is important, and some progress can be made in this by the average person. How well (if at all) can you tell when or whether the other fellow—the would-be Ivar Kreuger, the small-time confidence man, the two-faced “friend,” the person seeking credit, or the applicant who boasts of past successes—is telling the truth? To put it more significantly, in these days of ever changing rackets, harassing necessities, and lurking alienation-of-affections suits, what defense have you against lies and liars, whether gentle, well meaning, or downright devilish? And how about compensation claims?

Although ingenious schemes and weird superstitions believed capable of spotting and checkmating falsehood are as old as the human race, until recently such questions as these would almost certainly have elicited only a superior smile and some such mocking comeback as “Huh, I suppose you, being what they call a psychologist, think you can detect lies as easily as though they were egg-sized bumps on the bean!” Today, on the contrary, any alert person who has even a part-time awareness of recent scientific and practical progress in the matter will stop, look, and listen.

For the interesting truth is that in the last few years, science has made seven-league strides in the age-old business of attempted lie spearing. Nowadays, not only are police in many parts of the country securing confession after confession from all types of lawbreakers by means of scientific discoveries, but many of the new findings and methods are readily applicable to the somewhat less tragic but equally complicated business of everyday lie hunting. All of which means, of course, not only considerable saving in police and court administration, through the elimination of long and costly trials, but that you, skeptical or believing reader, can if you like build yourself a far better defense against liars, barefaced or otherwise—a defense that may quite well save you time, money, and heartaches.

In Federal compensation court, at Buffalo, late in the summer of 1935, for instance, a man was trying to obtain

workman's compensation on the claim that he was permanently disabled when some bags of sugar fell on him, two years previously. His disabilities were located in his back, according to the claims. Now, as most executives know, a sprained or injured back is most difficult to establish, or disprove, definitely. It will not show up in X-ray films, and usually such cases hinge upon which side obtains the more skillful medical witness. As a result, a sprained back is the favorite injury of the sharper who takes advantage of the compensation laws, a fall—resulting in injustice to many who actually are injured in the back, because of the wall of prejudice built up by the cheaters.

In the Buffalo case, since X rays would be of no avail, the precedent-making venture was tried, and admitted by the examiner, of using modern lie-detection methods. The instruments showed that the applicant was probably exaggerating his disabilities. And, most dramatically, they showed no change whatever when the applicant for compensation was unexpectedly touched at the spots for which he was claiming great pain and suffering.

Buried away in the press association wire reports, sometime earlier, was an item signalizing modern police progress in lie detecting. It was a story which came out of Chicago, where notably successful work along this line has been done, to the effect that the Junior Association of Commerce had awarded a medal to Leonard Keeler as the man between twenty-one and thirty-five who had made "the most outstanding civic contribution to Chicago" in the year 1932. Keeler, hailed as a champion lie detector, was credited with having in 1932 obtained eighty-seven confessions from arrested lawbreakers by means of scientific lie detecting.

As in all other police lie-tracking studies, they in Chicago use various machines and apparatus designed to catch falsifiers. There, as elsewhere, these devices vary from elaborate costly machines to simple homemade contrivances invented by local lie hunters. Yet, however these

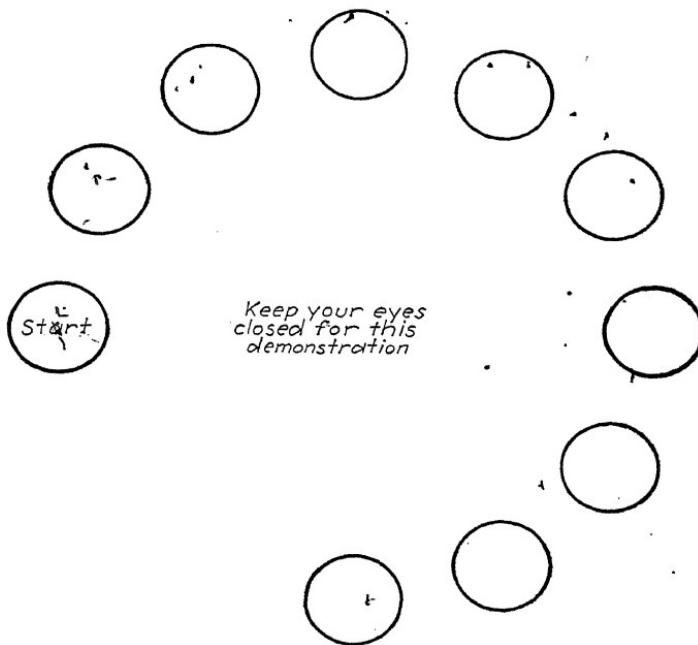
scientific detective implements vary in the various police laboratories, they are, by and large, all based on the observance and measurement of various bodily changes which science has discovered almost invariably accompany, in some degree, the excitement caused by lying. Curiously enough, so successful have they become in the detection of lies that there are many recorded instances wherein the mere sight of the elaborate apparatus used in lie detecting has so frightened the accused that he or she has broken down on the spot and confessed rather than endure the ordeal of scientific examination.



Here then are the signs to look for when you suspect a man or a woman to be lying: changes in blood pressure, rate of breathing, and pulse; bodily movements to right or left, too slight to be noticeable unless you are keen eyed and keeping a sharp lookout for them; change in the voice; certain gestures of the hands. Last but not least, there are movements of the throat, indicated in men oftentimes by the so-called Adam's apple, and subtle shiftings of the eyes. Do these seem technical or medical signs, such as only delicate instruments and the gadgets of science could detect? Well, they are not; and anyone, using the hints herein set forth and a good sharp eye, can spot them. Let us see how.

Take, for a beginning, the slight bodily movements. That such tremors occur in the body during the process of lying is easily demonstrated. Lie some time to a friend—just for science's sake, of course—and observe the tension, slight though it may be, that arises in your muscles. The existence of this tension seems to be due to the suspense which naturally develops as you wait to see whether your lie is to be believed or whether dislike, distrust, or difficulty is to be aroused in the other person. Many experienced liars, as well as tyros, have this tenseness and tremor, though the practiced prevaricator may be far less disturbed by it than

the honest fellow taking an unaccustomed flier in deception. This is not a new discovery by any means; ages ago the Hindus had an inkling of it, believing that human beings always move the big toe when telling an untruth.



Take a lead pencil, place the point of it in the center of the circle marked "Start." Then look for a few seconds at the other circles. Then close your eyes and keep them shut while you try to mark inside each of the other circles. After you think you have marked all ten, open your eyes and count those in which the pencil marks are inside the circle. After doing your best, turn to the end of the chapter to find how good your score is.

But while the wise Hindus watched the big toes of suspected liars, moderns have developed a much more reliable process. As the police sometimes use it, the suspect is seated and made to rest his right arm upon a thin flat rest, suspended from the ceiling by cords affixed to each corner. Attached to the bottom of the board, or "planchette," is a pencil with the tip just touching a white sheet of paper on the table beneath. In this position the suspect is ques-

How to Use Psychology in Business

tioned. Thus if there are any sudden tremors, starts, or shifts, caused by excitement—such as the excitement of false denial or protest, or by the telling of lies on the acceptance of which one's fate may depend—the pencil draws its telltale line on the paper. Incidentally, it was such bodily tremors, and not spirits, which operated most of the ouija boards so popular some years ago. About this we shall learn more shortly.

All very well for the police, it may be thought, but how are you to get salesmen, swindlers, and even sweethearts to put their arms on planchettes, even if you could carry one around with you? Planchettes aside, however, there are various ways of detecting untruths.

One is to hold, as in a long handshake, the hand or wrist of the person you would test. This may be difficult with swindlers, but it is surely possible in the case of a lover, a marital mate, or children. With a little practice, many persons become expert in detecting the slightest tremors or movements on the part of others with whom they have such contact, and almost anyone can do it to a degree. For the rest, if you watch, though the person you suspect may be lying closely and steadily enough, you can usually see discomfort and unease in his bodily condition; indeed, if he thinks you are suspicious, his movements and tremblings may become so marked as to be readily visible to one who has eyes to see. Gestures of the hands, movements of the throat and the eyes—indications of the type which, according to experienced lie detectors, are of the utmost importance—also tell volumes about lies and liars. Yet most of us never think to watch for them.

Sometimes, however, these actions tell a story directly opposite to that being voiced by the accused or the suspect. One of the best examples on record is that of a middle-aged recluse, who was one of many witnesses called during the investigation of the fatal strangling of an upstate farmer. The killing had taken place in a lonely cabin, and there was nothing to connect the recluse with the crime except

that his own home, where he claimed to have been asleep at the time, was not far away. He made a good witness and was about to be excused, when the coroner asked, "Were you on friendly terms with the deceased, Mr. _____?"

"We were the best of friends," said the witness, but the coroner noticed that as he spoke his hand, resting on the chair arm, clenched until the knuckles went white. That simple gesture started the investigation along lines that proved the recluse to have been not only a liar on the stand, but also the murderer.

Similarly, not long ago, I had the misfortune to witness a quarrel between a young husband and his wife. He had failed to come to dinner after she had prepared it, indeed, had not come home until late in the evening. He told a long story about being detained at the office, but was agitated and tremulous throughout. His wife stormed about but did not watch him, although I did. Time and again, his startled gaze rested briefly upon a picture of Alfred E. Smith, whom he greatly admired, upon the table near by. Finally, he sat forward and his elbow knocked the portrait face down upon the table.

I thought nothing about it at the time, but later, in divorce proceedings, it came to light that he had been out that night with his stenographer, whose name, too, was Smith. Without doubt, he was afraid that the former New York governor's likeness might suggest the stenographer's name to his wife, and consciously or unconsciously he got it out of the way. For my own part, I believe that few barefaced, emotional lies are uttered without similar, if not usually so striking, giveaways, and I have often speculated how many such telltales accompanied the innumerable lies with which the late Ivar Kreuger hoodwinked the leading financiers and investors of half the world. That there were plenty which would have aroused the suspicion of any competent and well-trained lie detector I, for one, have no doubt.

What the eyes of liars have to tell is, perhaps, even more striking. Your trained lie detector no longer places much importance on whether the eyes of a person engage his own steadily and unwaveringly, or whether they shift and falter. For the fact is, experiments have proved that it is possible for the worst liar to possess the most steadfast and seemingly honest gaze, and for honest men to be unable to look openly and steadily into another's eyes. What the lie detector considers is the *way the eye shifts*. Curiously, it is the way the eye lags, or is held by objects connected with the lie, that reveals the story.

Among lie detectors a special technique for measuring this lag has been developed. With a long pointer fixed to a band around his forehead, and protruding straight out in front like some odd single horn, the suspect is seated in a chair directly in front of a small door. On a level with his eyes a horizontal scale across the door and the wall on either side is painted. Various persons with nothing particularly remarkable about them enter the door, close the door, and stand facing the suspect.

As each one stops, the man in the chair is ordered to close his eyes, turn his head to the right, say, and open them. He is asked what figure on the horizontal scale he is looking at. Then the detector, who stands behind him, silently records his scale reading, and the point on the scale to which the pointer on the suspect's head points. Presently, into this procession of men passing in and out the door comes, for example, an accomplice, or suspected accomplice, whom the suspect has denied knowing. Or, it may be a surprise witness, who claims to have seen him, say, at the crime scene. If, as he claims, he does not know, or has not mentioned the person, his head turns as before, and the difference between what he reads on the scale and what the pointer indicates is about the same. But if he has lied, in spite of him his eyes cling to the person in question, and though the pointer indicates about the same figure on the scale, he reads a smaller one, that is, one near the person at the door.

Naturally, the same thing holds true outside the lie-detecting laboratory. The liar's eyes lag after objects or persons which hold a threat of discovery for him. "Do you know that fellow who just passed?" you may ask. He says, "Never saw him before," but if you watch his eyes you find that they hang to the corners, following the fellow you mentioned. Perhaps, instead, he may jerk them sharply away, whereas if the person held no danger of revealing his deception, his gaze would turn smoothly and easily enough. Just so will the lying thief's eyes cling to articles stolen by him but recovered, perhaps, from hiding places impossible as yet to connect with him. Or the faithless lover's eyes will cling to incriminating letters or trinkets which he believed he had destroyed.

Yet in many ways the lie detector finds his best field of observation to be the region of the throat, mouth, breast, and upper arms. For example, as the Orientals knew long before the days of Confucius, fear shuts off the secretion or flow of saliva in many persons, though not in all. Now, lying, especially where there is much at stake and where the penalty of discovery means loss of money, respect, love, or freedom, breeds fear or similar emotions which act in the same way. In the old days, the Orientals were wont to give a suspected liar a handful of rice to chew; if he could spit it out, they declared him honest; but if he could not summon enough saliva for this, they judged him afraid of discovery and so a liar.

Modern lie detectors, however, do not depend upon rice; they simply watch for the well-known signs of dryness in the mouth and throat, the excessive swallowing motions, so well indicated by the actions of the Adam's apple in men, the fearful liar's frequent attempts to wet dry lips with a drier tongue, and the huskiness which this same dryness will breed in the throat. Look for these indications the next time you suspect someone of trying to put over a big one. They

won't appear right off, perhaps; but as the lie grows, they are likely to make themselves known.



Because of the well-known fact that telling a lie, or a series of lies, increases the blood pressure of the liar, and affects the regularity of his breathing, the trained lie detectors pay a great deal of attention to these things. The usual practice is to band upon his arm apparatus for keeping track of the blood pressure, and about his breast other equipment for measuring the rate of breathing. Thus unable to escape the secret revelations of his body, he is quizzed or confronted with accusers, witnesses, and incriminating facts. Very scientific and accurate methods of calculating differences, especially as to breathing, have been developed. But in general, if the blood pressure goes up perceptibly after an answer, the long chance is that the suspect is lying. The same is true if his breathing rate changes and quickens after such an answer.

Some lie-detection experimenters regard the changes of breathing as signally important. Benussi, for instance, has been experimenting with it for more than fifteen years. He has developed an elaborate device which measures the difference between the time spent in inhaling and exhaling. With mathematical formulae he is able to make minute comparisons between breathing before a question calculated to demand either a truthful answer or a lie has been asked, and immediately afterward. A sharper, shorter inhalation after the question, in general, is taken to mean some emotional disturbance in the breast of the person being questioned—the kind of emotional disturbance that is almost sure to be present if the subject is lying. A longer, easier inhalation, on the other hand, is taken to indicate the relief of being able to answer honestly and hence having nothing to fear.

Watch for a slight catch of breath as indicating that the person is about to lie. Of course, such scientific procedure

is impossible to the casual, everyday lie hunter, but he can watch for the sharper, shorter breathing of emotional disturbance in the suspected liar, and with a little practice can make a very fair record of observance. As for increase of blood pressure, in periods of excitement or stress apt to accompany lying, in very thin persons you can actually often see the increased blood pressure in the increased beat of the carotid artery, which is located in the neck just below the ear. Sometimes he blushes. Even his neck may become red.

If you got more than four pencil marks inside the circles on page 201 you were peeking—or else you are luckier than one person in a million. Those who cheat at solitaire can be suspected of keeping one eye a little bit open in this test of self-honesty.

CHAPTER 14

SOME WAYS TO READ CHARACTER

During the Franco-Prussian War, a little more than a half century ago, a young army surgeon was operating on a soldier with a skull wound which exposed the surface of the brain. Dr. G. Fritsch, the surgeon, experimentally applied a weak electric current to the brain surface and noted that this caused a twitching of some of the patient's muscles. A short time later, Dr. Fritsch talked over this remarkable observation with a fellow scientific worker and together they performed experiments upon dogs. These experiments of Drs. Fritsch and E. Hitzig are scientific classics.

They were the first to discover that the left side of the brain has centers for controlling movements of muscles on the right side of the body. When the brain was stimulated near the top of the skull cavity, movements of the foot and leg were observed. As the mild shocks were gradually moved toward the bottom of the brain, muscles of the trunk and fingers and arms were caused to twitch. Near the very bottom of the brain surface, twitches of the face muscles were produced.

This is commonplace information to many people now, but it took courage in 1870 to announce such observations, because the scientific world at that time was firmly set against any idea of mental functions being located at any definite place. No doubt, Fritsch and Hitzig were called phrenologists and even worse by their scientific confreres, but they stuck by their guns and laid the basis for modern brain surgery. Unfortunately their work was seized upon by a few fanatically inclined persons and used by them in an attempt to revive the old idea of phrenology. But in this

attempt to bring phrenology back to life the two scientists had no direct part and to it they lent no encouragement.

The world of science in their day was reluctant to believe that stimulating the brain at any place would bring about definite muscular contractions, because they had been



This unretouched photograph, made in the author's personal laboratory, shows plainly how the contour of the outside of the skull is no indication of the brain inside. Note the space separating brain from skull. (Copyright 1935, D. A. Laird.)

disgusted with the teachings of Franz Gall, the father of phrenology. Gall had tried to start a science of reading character by studying the shape of the head and facial features. He became too enthusiastic, however, and led a group of his camp followers with such zeal that soon the French state called a halt to his activities, being fearful lest they would undermine religion. This was about a half century before Fritsch's observations in connection with the surgery of the battlefield.

Gall started out as a careful scientist, but he soon became oversold on his fundamental ideas and disregarded ordinary scientific precautions. He became an applied scientist too

soon. He overlooked instances which contradicted his ideas, drew conclusions from an insufficient number of cases, and finally the practical urge led him on to the disastrous method of reasoning by analogy.

Many ludicrous inferences arose from his reasoning. A person with hair worn after the fashion of Lloyd George suggested remotely the appearance of the male lion and was assumed to have lionesque traits. Of course, anyone who wishes to can have his hair trimmed in this manner.

Persons with prominent foreheads were given credit for intellectual brilliance, when we know that usually prominent foreheads are caused by rickets in childhood. Others with small eyes were given credit for serpentine qualities. Is it any wonder that scientific workers in the middle of the last century were suspicious of anything which smacked of phrenology in any way?

The work of Fritsch and Hitzig made phrenology appear still more ridiculous. At about the top and center of the skull, for instance, phrenologists had said that love for parents was located, but Fritsch and Hitzig found that the brain center at this location controlled the movements of the foot.

Still, nothing seemed to stop the progress of phrenology until it had naturally spent itself. Every critical study made of it revealed that in no detail could phrenological teachings be accepted as true. Yet it grew, and schools were established and phrenological museums started.

Even now phrenology, while out of consideration as a science, has not spent itself as a cult. Of course, you have seen a small tent at some carnival, fair, or circus, with a painting of a large head divided into zones like a parcel-post chart, hanging outside. Very few people take this side of phrenology seriously; it is entertainment pure and simple, unusually simple.

There are a school and a museum of phrenology in the roaring Forties in New York City. In a small Midwestern village there is a correspondence school of phrenology. For forty dollars cash (add ten if by installments) you can take

thirty lessons by mail, which will earn you the degree of M.P.S., which to the initiated means Master of Phrenological Science. If you raise the ante and take a few more lessons you can become a D.P.S., Doctor of Phrenological Science. A recent United States senator who was on important educational committees held an "advanced degree" from this school and read the magazine each month. A school superintendent in one of the largest Texas cities recently completed the course with "Books and calipers furnished free as needed, which you keep. Also a fine diploma when done."

Phrenology some time ago tried to reform itself as physiognomy, by considering all physical features, such as texture of hair and skin, shape of fingers, and general build, as well as merely the relations between different parts of the skull, to which phrenology proper had confined its attention.

The fairly muscular person with a bronzed skin and large bones, as shown by big hands and feet, probably takes on this appearance because of the activity of his pituitary gland. If such is the case, a person with this appearance in most instances will be difficult to tire out and possibly will have high ideals. Further than this we cannot go in bringing modern scientific knowledge to interpret such a character, and it may be that we are not justified in going even so far.

But for such a person physiognomists have a whole catalogue of character readings, which include the type he should marry, the occupation he should follow, and the places where his investments will be the most successful. You can buy on the newsstands magazines which contain advertisements of those who will read your character from a photograph of yourself, if you will send one. These things simply show that Barnum was right, and not that reading character from physique is right.

How to read character from handwriting is the subject of a book which had a tremendous sale not long ago. It appeals

How to Use Psychology in Business

to the imagination to be able to double-cross your friends and read their character from the notes they write. I do not worry about really giving away any inner secrets myself by the way I write, for I am familiar with careful studies made of claims of graphologists which have revealed the complete inability of some of them to tell even the sex of the person writing.

It does seem reasonable to suppose that the person who crosses his "t's" a quarter of an inch away is slovenly, but we must remember that this is reasoning by analogy and does not give trustworthy evidence about the character of the writer. Belief in it, however, indicates gullibility on the part of the believer.

To the scientist, phrenology, physiognomy, graphology, and the other ologies dealing with character reading are of little concern, except as widespread superstitions. I think that these are vicious superstitions, since they are blocking the road for real progress of scientific discovery in the field.

There are a few modern Fritschs and Hitzigs, who are courageous enough to brave being called "reincarnated phrenologists," and who are doing research of the first water in the quest of something which may make possible a truly scientific kind of character reading. Here and there they have opened a way through which we see a glimmer of light which encourages many of us who are hopeful that perhaps we may be on the verge of a true science in this field.

Of three things we are certain. No alleged method of character reading by bumps is trustworthy in the least degree. There are positive indications that we may shortly have real insight into character reading. When we do have this insight, the subject will not be so simple as fraudulent books and articles on it would make us believe.

Fraudulent but interesting schemes for reading character will always have in their favor that they are so exceedingly simple that anyone can use them after a few hours' study. The correspondence course in phrenology to which I

referred, for instance, after thirty lessons-by-mail, prepares the student "to give lectures and charts, begin the practice of the profession, and make money."

It is from studies of people with mental breakdowns that the newer scientific knowledge as to how appearance may present clues to the underlying mental make-up is developing. There is little strange or new about the actions and thoughts of people with disordered minds, although the average person suspects something very different. In practically all instances, a disordered mind is like any normal mind that is exaggerated in some respects. It is important to appreciate this fact to understand how we may be able to learn from the study of wards of a mental hospital about the characters of people in general.

We all have moods. Some days we are right with the world and everything is going swimmingly, but other days things seem blue and we find it difficult to keep the pep and enthusiasm and cheerfulness of yesterday. If you can imagine this change in moods exaggerated perhaps a thousand times, you will know how the patient with manic-depressive mental disorder feels and acts.

A short time ago, I met a famous American sculptor whose works are perhaps reproduced in pictures on the walls of your public library or schools. I met him in the ward of a mental hospital. He was sitting on a chair, the picture of profound melancholy, with his frame bowed and his hands clasped desperately between his knees, while tears trickled down the cheeks of his mournfully lined face. It was an unexplainable spell of the blues, but much more deep than those you or I usually experience.

The following day I saw him again, but he had changed so that he was scarcely recognizable. His face beamed happiness. He was so peppy that the hospital physicians were afraid he might break the chair when he sat down with a great, happy thump. He talked incessantly and hilariously.

If his wife had seen him then, I am afraid she would have suspected that he had been drinking and had a happy jag.

It has been discovered that the manic-depressive patient, such as this well-known sculptor was for a while, has a type of body build different from that of most other mental patients, and different from that of the average man. Some "average men" have a body form which approximates closely that of the manic-depressive person, and it has been discovered that in most instances these have a mental make-up which is similar to that of the manic-depressive, but the changes are not so marked.

Such persons are energetic and emotional. Baldness and gray hair are common among them. The type of build reveals a relatively large trunk volume in proportion to the limbs. They are "well-fed" persons, although not necessarily fat. They may have long trunks and short legs rather than the pouchy, fat type of trunk. They are called of *macroscopic build*, although somewhat synonymous terms for this constitution are: brachymorphic, megalosplanchnic, pyknic, cyclothymic, or brachyskelic. The wide variety of terms for this build reflects the unsettled state of research in the field but is not unusual. The businessman should not criticize the scientist for having a mixture in terminology so long as the plain old-fashioned hamburger steak is also known as minced tenderloin and Salisbury steak.

A simple measure which approximates accuracy for determining this build is to divide one's height in inches by his weight. If the height-weight index this yields is below 0.42, a man is probably of macroscopic build, and probably has the complex traits found in the majority of macroscopics. If the height-weight index of a woman is below 0.45, she is probably macroscopic. Women are more macroscopic than men, and everybody is macroscopic in his youth.

Dr. George Draper of New York City has found that this type of constitution is closely associated with gall-bladder

disturbances. This does not mean, of course, that all macro-splanchnics are doomed to gallstones and manic-depressions—it simply means that very seldom are gallstones found except in this type.

Dr. Elida Evans has recently reported that cancer is rarely found except in this build, and her observations have been confirmed in essence by Dr. J. H. Cassity, formerly of Saint Elizabeth's Hospital in Washington; yet one of my friends who is distinctly not of this build was recently operated upon for cancer. Exceptions are always to be expected in a field in which definite knowledge is still being laboriously accumulated.

Let me introduce you to another interesting mental and constitutional make-up. Do you know a child who would rather read a book than play vigorously and emotionally with other children, especially if it is a book of imaginative stories? Or do you know some grownups who like to be by themselves, who are hard to get acquainted with, and who are bookishly impractical? They are "drawn into a shell."

If they withdraw farther into their shells, talk scarcely at all, and live in their imaginations, they soon begin to believe what they imagine, and declare that people are saying bad things about them when there is no person within earshot, or think that they have great property, as the imaginative child imagines that some paper clippings in a cigar box are treasures. When this stage has been reached, they have a mental disorder known as schizophrenia.

Some time ago, I visited a distinguished minister who was a patient for a while in a hospital at a time when he was acting abnormally, owing to schizophrenia. He was so completely engrossed in his imaginings that he apparently did not see me. He would smile from time to time as some pleasant mental picture was formed, and would move uncomfortably at times when the mental pictures were not pleasant. Once he turned and talked to two people at his

left, although he and I were alone in the room, and I was on his right. Imagination had gone riot!

The researchers we have mentioned have discovered that in most schizophrenia patients there is also a distinctive body build. This is usually the exact opposite of the macrosplanchnic. Long limbs with a relatively small trunk volume are characteristic. These are long-legged, thin people in general, although a fat person may have such long legs and arms that they throw him into this group. They are more intelligent as a rule than macrosplanchnics, and are more easily fatigued and more sensitive to pain.

This is the *microsplanchnic build*, although it sports many names which mean much the same constitution, such as, dolichomorphic, asthenic, schizoid, hypovegetative, hypoplastic, and dolichoskelic.

This type is more common among men than among women. A man with a height-weight index above 0.58 has this constitution in most cases.

Dr. Draper has found that this is the gastric-ulcer type, most patients with that ailment coming from the group with this constitutional make-up. They are also especially prone to tuberculosis, as well as having their distinctive mental make-up in most cases.

The tape measure and the bathroom scales help to form a fair index of type of build, but they are not completely trustworthy. A series of twelve measurements made with delicate instruments is essential to get an accurate morphological index, although the height-weight index approximates this closely in many cases.

From childhood to old age we all pass through a transition in these constitutional features. In emotionally pleasurable and energetic childhood we were more macrosplanchnic than we are in maturity, and as old age draws over us we become more inclined bodily toward the microsplanchnic and mentally live more in the realm of fancy, as well as having more trouble with what we should eat.

Some Ways to Read Character

As we deviate somewhat from the average between these extreme types in build, so are we likely to have somewhat distinctive mental traits, without being in any sense abnormal in either build or mental make-up.

All the experimental trends indicate that for some outstanding but complex mental make-ups there are closely associated body builds or constitutions, which are complex. They do not indicate any simple and infallible way of reading the character of our enemies or our supposed friends. But in the hands of a skilled person even the present findings can be of tremendous helpfulness in laying out a program for mental hygiene for an individual, or in indicating precautions which each individual should follow in order to maintain good physical health and adaptability for certain kinds of mental and physical work.

CHAPTER 15

HELPS IN READING FACES AND THOUGHTS

Someone has said that a French farmer does not hire a laborer until after watching him eat. One who eats fast, the farmers believe, will be careless in his work, while the slow eater is supposed to be a slow worker. The laborer who cuts the cheese in big hunks is wasteful, while the one who cuts it as thin as paper is too dainty to have around a farm.

The justification for this method of character reading is probably pretty doubtful. The best methods are those which observe the person in the actual work or situation for which he is being engaged or studied. The fellow who is careless in eating cheese may be a tightwad with his money and extremely particular about his wife's conduct.

Better for sizing up human nature is the practice of some sales managers. It is to take a walk around town with the promising man who is being interviewed. The manager likes to see to whom the applicant speaks, to find out the type of friends and associates he has, whether these people seem warm and friendly or merely polite, and so on.

Many similar rough-and-ready schemes for sizing up people have been tried. For some of them there is a bit of scientific justification. The crafty Cardinal de Bernis, while French envoy to Venice, recorded: "no minister in a foreign land was ever better informed than I, without showing the least curiosity or eagerness for information; the spies that were sent to fathom were the ones from whom I got most profit and knowledge of what it was important to know." Then he added, "I have always had a talent for reading physiognomies and enlightening myself by chance words, of which I have often made the application with great accuracy."

Important to all of us, whether diplomat or mere citizen and businessman, in our daily association with people, many of whom are strangers to us, is some basis for sizing up human beings with some accuracy. Consciously or not, practically all of us do make quick estimates of the people we meet, even if there is nothing more definite than developing a vague feeling that we like or dislike them. We may call this a hunch, or a woman's intuition; but whatever we call it, we are starting in a haphazard fashion to read character. It is believed by many people that women are blessed with better intuitions along these lines than are men, but that is getting ahead of ourselves.

What we want to find out first is how, whether in poker playing, in sales work, in credit work, in employing people, science can give added accuracy to the common-sense hunches of everyone in "reading" other folk.

Science can give much help, but it can probably make no one 100 per cent, or perhaps even 75 per cent perfect, in reading character. Many "professional" character readers have no success at all when put to a real test of their delineations, which are often as much in error as old-fashioned phrenology. Of course many people who do not profess to know much about character reading have been found to be wrong just about as often as they are right. Prejudice rather than science or knowledge guides them, and they give an unfavorable sizing to a person who may actually be sterling but who has some minor characteristic which is disliked—such as not trusting Samuel Seabury because he is continually clearing his throat when talking, or William Gibbs McAdoo because he is thin and gaunt, or Al Smith because he always looks as though he were chewing tobacco.

In the past ten years, scientists have made interesting discoveries of how character reading can be improved by anyone. These discoveries are not as well known as their great value should make them. This may be because most intelligent people have learned of the many studies which

How to Use Psychology in Business

have proven that there was little truth in the phrenological bump reading of grandfather's day, as the recent discovery of Dr. Aleš Hrdlička, based on thirty years' study, that the height of foreheads is no indication of one's intelligence, regardless of race. This has led many, wrongly, to assume that our faces do not give us away.



Look for the muscles which lift the eyebrows when one is interested, and for the ones which lower them in antagonism. The muscles which control expressive movements around the eyes can be profitably studied to improve ability to read faces. This is an unretouched photograph of a dissection made in the author's laboratory by a special method which makes the borders of the muscles readily distinguishable. (*Copyright 1935, D. A. Laird.*)

Painstaking experiments made by many scientists in recent years, however, have shown that we can learn much about other people by studying their external characteristics. And what is especially encouraging is similar research which points out that with a little practice the average person can greatly improve his ability to read others.

Prof. Floyd H. Allport, of Syracuse University, for instance, tried the experiment of training people so that they could read emotions better, and found that studying the muscles used in facial expression helped enormously in improving the ability to read the emotions of other people. Dr. J. P. Guilford, of the University of Nebraska, also

Helps in Reading Faces and Thoughts

found that practicing in reading emotions from peoples' faces for only a ten-day period produced big results. Drs. Allport and Guilford both find that training or practice helps those who have trouble in reading faces more than it helps those who are good at it from the start. These experimenters also find that emotions can be read best if instead of trying to analyze the face, detail by detail, we view it as a whole.

Drs. S. W. Fernberger and E. Jarden, of the University of Pennsylvania, have found that training ordinary people will improve their ability to read anger, for instance, from 36 per cent to 56 per cent accuracy, which is a good record for an amateur.

Dr. G. S. Gates, of Columbia University, studied nearly 500 children from three to fourteen years of age and found that the only emotional expression which could be read by the three-year-olds was laughter, that pain was not grasped until six years, anger until seven years, fear until ten years, surprise until eleven, and scorn until considerably later. This valuable experiment shows that as people become older, there is some natural development in the ability to read faces, while the work of Allport, Guilford, Fernberger, and Jarden shows that training is perhaps still more helpful than natural, unaided development.

The movies may actually work contrariwise and spoil us for sizing up character. This is due to the fact that the casting directors, in order to make the pictures crystal clear, have to pick out extreme types of faces, as well as types which appeal to popular prejudice. The reason for this dulling effect on our ability to size up is not because the movie types are often inaccurate, especially in the case of physicians, college professors, executives, and other professional classes; the dulling effect is due to the fact that in ordinary life we must be sensitive to slight nuances, to slight variations, while the movies give us practice on only the extreme types. After seeing "Little Caesar," for instance, one could live with the desperate but gentle-



Try to read the expressions in these eyes. All photographs are of the same office business. (*Candid camera photos*)

manly appearing Vannie Higgins and think he was a Sunday-school superintendent. In similar fashion, very few suspect the crookedness of an Ivar Kreuger, or the hidden sinfulness of some suave ministers.

Various occupations can be detected from faces, however, as a study by Prof. L. Gahagan shows. He found that politicians, writers, businessmen, and scientists could be detected with some accuracy by strangers from photographs alone.

Sizing up character really starts with recognizing in persons emotional expressions, such as mirth, resentment, gratitude, anger, indignation, and so on. Dr. A. M. Feleky has found that ordinary people can tell with considerable accuracy the emotion that a skilled actress is trying to portray by her facial expressions; but here, as in the movie types, the emotional expressions are exaggerated by the actress more than they would be in real life. Prof. H. S. Langfeld, of Princeton University, has found that emotions such as mirth can be read by the average person much better than such emotions as despair. Once details are understood, however, reading skill increases.

Take the expression of the emotion of anger when someone is trying to conceal its manifestation. Late in 1933 Dr. R. W. G. Hingston, of London, reported that this is revealed by the head's being held a bit higher, chin pushed



businessman, and show widely different emotional states in the course of usual
in this chapter courtesy Leland Coal Co.)

slightly forward, upper lip raised a little, eyebrows drawn downward, corners of the nose raised, and forehead wrinkled. Each of these expressive details, taken singly, may be difficult to detect, but the total changes, once we know what to look for, are exceedingly clear.

The facial muscles involved in such emotional expressions are being studied by Drs. Ernst Huber and P. Lersch on a new basis, which leaves far behind such crude observations as those of Napoleon's Empress Josephine, who, in noting the leaders of the French Revolution, said that "Danton had the head of a bulldog, Marat that of an eagle, Mirabeau that of a lion, and Robespierre that of a cat." She also said: "The physiognomy of Robespierre would change according to the occasion; sometimes he had the shy, unquiet mien of the cat; now the ferocious visage of the wild cat; and now the fierce aspect of the tiger. The temperament of Robespierre was at first melancholy, but became at last atrabilious. In the Constitutional Assembly his complexion was calm and sombre; in the National Convention it was yellow and livid. In the Constitutional Assembly he seldom spoke without sighing; in the National Convention he never spoke without frothing at the mouth."

From the more recent studies of emotional expression, such as Drs. Huber, Lersch, and others are making, a more scientific basis for improving this ability is achieved than in comparisons to eagles and lions. We can improve our national ability, for instance, according to work done



photographs of his mouth? From left to right, these match the photographs
eyes.

How to Use Psychology in Business



Now try reading the expression on the entire face. You will likely find it photographs are the same as on the preceding pages,

by Dr. Caney Landis, at Wesleyan University, Dr. Knight Dunlap, of Johns Hopkins, and Dr. Christian Ruckmick, of Iowa University, by watching the lower half of the face rather than the upper half. Although most legends predict that the eyes are more important, these critical investigations show that the faces can be read better if we focus our attention primarily from the tip of the nose downward on the lower half of the face. The eyes are practically unchanged, for instance, in mirth and disdain, and are also practically the same in disgust and elation.

Some faces are hard to read for an interesting reason. Many emotions are primarily states of inner feeling accompanied only by what Dr. John B. Watson calls implicit, or almost unobservable, changes. Examples of these are parching of the throat and pounding of the heart. In such cases we must train ourselves to read voices as well as faces. That this is possible to do is shown in experiments by Dr. Mandel Sherman at the Washington Child Research Center and by Dr. Frederick L. Wells of the Boston Psychopathic Hospital.

Experienced detectives, when grilling a suspect, watch his Adam's apple, because it reveals dryness of the throat when it becomes more active than usual. Of course this fails in the case of women, where the Adam's apple is invisible. Clutching, wringing, sweating of the hands can also be observed. Since we express emotions as well as character in general through the behavior of the entire body, it is wise to give some attention to the other parts of the body as well as to the lower half of the face.



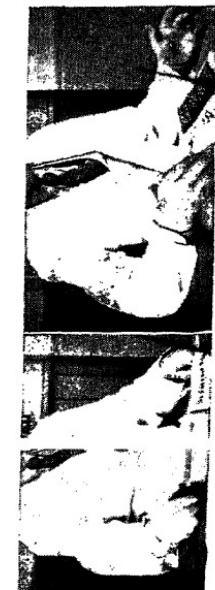
easier to do than specializing in some theory about eyes or mouth alone. These and are in the same order from left to right.

The whole body involuntarily betrays emotions. Dr. H. C. Harshberger, at Columbia University, found that gestures of arms and hands, without the facial expression's changing, enable a person to read emotions correctly in about half of the cases. When reading gestures is combined with reading the lower half of the face, a great improvement in this skill follows. It has recently been shown by another Columbia University psychologist that in poker players the elbows should be watched.

Mark Twain had a hunch along these lines, long before any research worker could tell him about it. In trying out a story he had written, he would carefully observe the gestures of a critic listening to it. If the critic did not move, or if he leaned forward, the famous writer knew that he had turned out a good story. But if the listener began to tap the table with his fingers, shuffle his feet, toy with a pencil, or clear his throat, Mark Twain believed—and probably was right—that he would have to write the story over again.

We now know that there is a sound scientific foundation for observing what people do, in order to size up their character and their fleeting thoughts. Slight movements and innocent gestures do give these away to one who knows how to read them. Consider a few dramatic illustrations.

There is the man who comes to a small town and places an honest wager against what seem to be uneven odds. He is to discover the location of some hidden object,



blindfolded, and without any words such as "warm" or "cold" to help him. If he does not ferret out the hidden object, his wager is forfeited. The only condition he imposes is that he be accompanied by someone who knows where the object is secreted, some well-known and trusted person who will keep the stranger from bumping his shins, and who could not possibly be suspected of being bribed to reveal the hiding place.

At the post office the pair start out aimlessly, while the crowd pushes close in. The blindfolded stranger is holding the arm of his guide. At the first corner the stranger says, "Turn to the left." The members of the crowd glance at one another. He is starting in the right direction!

Another corner is turned, and another. In front of a firehouse the stranger stops his guide. The firemen, who have deserted their checkerboards, look in apprehensive amazement toward the chief's office. In the pocket of his overcoat is the yellow card which was hidden, and which in five minutes the stranger has discovered.

A difficult feat, but simple. And its explanation yields hints for simplifying many of the difficult things of life.

What happened at the first corner? The stranger, without hesitation, told his guide to turn to the left. It was not a lucky guess that made him say this. The guide told him what to say! The guide did not move his tongue, but the movement of his arm on which the stranger's hand lightly rested told, as plainly as words could, which way to turn. The guide was thinking, even talking, with his arm muscles, just as you and I are always doing. At the turn, he unconsciously helped the stranger on his way to the hidden card and the winning of the wager.

In these thinking muscles there is a great avenue to the understanding of others. Yet some horses and dogs are able to find it; perhaps this is what was in the mind of the originator of the phrase, "horse sense."

One of the most famous thinking horses was discovered in Germany a few years ago. Through his accomplishments



When the entire person is observed, the accuracy of reading expressions is greatly increased. These photographs are in the same order, from left to right, as all the earlier candid camera photographs. With this information, you can make comparisons between these pictures and the isolated sections reproduced earlier.

he became known as Clever Hans. Hans was able to solve difficult problems, even in arithmetic. Scientists puzzled over Hans for some time, always looking for a difficult explanation. Sermons were preached about him, and even vaudeville offers were received.

Hans worked his problems in the same way that the stranger located the card. He tapped away at the answer until the audience leaned back as the right number was reached, much as if they were saying "Isn't that wonderful!" The horse did not know what all the excitement was about, but he had accidentally found out that he should start tapping upon a certain signal and stop when the spectators changed the position of their muscles with the "Isn't it wonderful!" attitude.

Some people still have faith in the divining rod, which they think will reveal the location of veins of water or of valuable minerals. Usually a forked cherry branch is used. If this is carried loosely in the hand while one walks over a hillside, it is supposed to tilt so that one branch points toward the ground when water is just underneath.

In Minnesota, a few years ago, there was a man with apparently remarkable "divining powers." An ore bed had just been surveyed by mining engineers, and this man was given a test of his abilities by them. He was taken along the places where they knew how deep the ore deposits were. It was a very severe test, but he was able not only to tell where the ore started but just how deep the vein was at different places.

Then scientists from the University of Minnesota gave him a more severe test. Objects of gold, silver, and copper were placed under a large table in a laboratory; he was unable to "divine" where these were when left in the room alone. Later he was taken back to the ore field accompanied by a person who did not have any knowledge of the location and depth of the deposits. The result was a miserable

failure. These and other tests indicated that in the earlier trials the ore had been "divined" in the way that clever Hans had performed—by an unconscious reaction to the thinking muscles of the bystanders.

I was talking with an insurance salesman who was unusually successful, largely because he had accidentally



The "Ouija Board," which tells credulous women's fortunes through their own involuntary pushing of the heart-shaped planchette which spells out the answers to their questions.

learned how his prospects' muscles were thinking. "I never try to close a prospect," he said, "when he is tapping with his foot, or twirling his thumbs, or fingering his vest button. But as soon as he stops these fidgeting things I know he is seriously interested and then I get down to brass tacks!"

A prospect's muscles had revealed to the keen salesman when the psychological moment had arrived. The rhythmic tapping indicated wandering thoughts. When it stopped, the salesman knew the prospect was thinking, as a man seized with an inspiration while he is walking, stops stock-still in his tracks.

A friend of mine who has been stone deaf since he was a small child is unusually successful as an editor. He says that

it is because his deafness forced him to find out what others were thinking by watching their muscles. On a trolley car he will notice what people are reading and keep a close eye on hands and face. He has learned to tell whether a person is reading the article just to kill time or because of a real interest in it.

There is a great deal of psychology in the saying that your actions speak so loud that others cannot hear your words. There was the woman, for instance, who refused to attend church after a new minister was appointed. "No one who was sincere in religion," she said, "would hold his hands the way he does when the collection is being taken."

The deacons tried to get her to change her attitude, but she replied by saying, "Wait and see!"

Within a year the deacons were searching for a new minister and eagerly seeking the woman's opinions of the way the new candidates held their hands during prayers and the collection.

Children, primitive people, and chimpanzees give play to extreme emotional expressions in which they jump up and down, stand on their heads, or throw things round. These, of course, are easy to read. But most civilized persons do not have this violent mode of expression. Hence there is the greater need for us to give close study to the details of reading emotions, and to practice with the photographs accompanying this chapter.

Fortunately, the means for study are at everyone's disposal. Consider this program of instruction. Go to the movies and forget, if you can, to concentrate on the vagaries of the plot, but instead watch the faces of the actors and actresses. From the progress of the story, you will note what emotion each impressive mimic portrays. Get thus the broad outlines of these emotional expressions firmly in mind. Then, when you are outside, with these outlines still in mind, watch everyday folk. You will

How to Use Psychology in Business

observe, of course, that in real life nobody but a lunatic goes to the length of emotional expression that is demanded on the screen. You will see only pale reflections of the actor's rage, joy, and other emotions. But having seen the exaggeration, you will all the better recognize the everyday basic expressions. Observing these everyday manifestations honestly—and I know of no more interesting and enlightening study—you will come to see nuances, or shades of emotion, in the folk around you. While another, seeing no sign of anger in a given man, will blunder along into a dispute or an argument, you, seeing the little signs, will be guided accordingly and may even save yourself the necessity of having to punch the man in the nose.

Once you have seized the general idea of emotional states and the way they react upon the face, then concentrate on the other bodily indications of emotional states, such as changing color, swallowing caused by a suddenly dry throat, the movement of the Adam's apple in a man's throat, the clutching and wringing of hands, or the moisture that comes in times of stress on some foreheads and the palms of some hands. We have seen that detectives do this kind of thing, though not seeming to do so. Indeed, watching the Adam's apple, knowing that its increased activity foretells nervousness, rising fear, etc., is one of their best tricks with a suspect. A clutching motion of a suspect's hand, as though it grasped a killer's weapon, is a sign of the inner rise of rage and desperation, the utter loss of control that often proves guilt or brings confession. There are countless such indices of emotions. Authors continually search for them, and you can find them mentioned, if you concentrate on the search, not only in textbooks, but in newspapers, magazines, and novels.

Now, assume that you have reached the point where you recognize with more or less accuracy just what emotions are apparent on the face opposite you. Suppose that you have gone so far that even in the features, or the play of the features, of the suavest, most accomplished dissembler and

fraud you can read emotional messages. What then? Well, then you must proceed simply to the process of always relating these emotional indices to the situations, remarks, or actions which preceded them, and therefore presumably caused them. Are they, in this case, commensurate and natural outcomes of such situations, remarks, or actions; or are they out of all proportion to them, either much more than would seem reasonable, or much less?

How much can be deduced about a given man in this way! Once, I remember, I sat talking to a stranger, trying to figure him out. A huge butterfly, a beautiful thing, lit upon the table. The man caught it, and while he talked calmly pulled it to pieces and dashed it to death upon the floor. What that told about him—cold, cruel, insensitive! In some such way it is simple to observe what things make a man angry, what things sadden him, what things cheer him, what things he admires; and to read him as though he had been all written out in a book.

The other day, police of Newark, New Jersey, took into custody the notorious Arthur Barry, cop killer, jail breaker and the highly successful robber of a score of millionaire homes on Long Island. Oddly enough, Barry would have been put down anywhere as a well-mannered, good-looking, middle-aged businessman; indeed, analysis of his photographs make him seem almost like a good bet for the movies we were talking about. For months he had been living quietly in a small town near Newark, boarding and rooming with a farmer. Neither the farmer nor any of his neighbors suspected that Barry, who was living on money he had stolen and posing as a salesman, was anything but an ordinary good citizen. That is, no one suspected except the news dealer from whom he bought his papers. Detectives, tipped off that Barry was hiding thereabouts, happened to question the news dealer. Like a flash this man thought of Barry and sent the police to the house where Barry lived. True, the police described Barry to the newsy, but the fact was that, all along, the dealer had been suspicious. Why?

Because, in a dispute about a few pennies for papers, Barry had become so inordinately enraged that the dealer feared for his life. In other words, that news dealer read Barry's true character in the excess of his anger, so unproportionate to the circumstance that caused it. In effect, he said to himself, that man is a potential killer, which he was. Just so will excess of modesty, sympathy, friendliness, etc., give the key to many characters if you look for it.

Yet, oddly enough, if you would be a good character reader, you must consider well your own inner man, and you must not succumb to the intensely human tendency to confuse a man's inner character with habits which you, personally, do not like. You must guard against thinking a man all bad because he drinks and you do not; or chews tobacco, which you loathe; or curses, while you do not. Get all the evidence before you consign the man to the inner circle or to outer darkness.

Since some people have deliberately developed their ability for sizing up, without the newer aids of science, we can understand how Lloyd George could outwit President Woodrow Wilson. At the Peace Conference one observer noted: "What chance could such a man have against Lloyd George's unerring, almost mediumlike sensibility to everyone immediately around him? To see the British Prime Minister watching the company, with six or seven senses not available to ordinary men, judging character, motive, and subconscious impulse, perceiving what each was thinking and even what each was going to say next, and compounding with telepathic sense the argument or appeal best suited to the vanity, weakness, or self-interest of his immediate auditor, was to realize that the poor President would be playing blindman's bluff in such a party."

Although the average person can improve vastly in reading character, perhaps doing as well as Lloyd George, Prof. Arthur W. Kornhauser, of the University of Chicago, found that only 10 per cent of employment managers of leading firms make a conscious attempt to analyze char-

acter. These men, strangely, use instead alleged "systems" which, if not deliberately fraudulent, are at least completely unreliable. Think what could be accomplished with such scientific training as has been shown.

Overlook nothing, but especially watch the face and the mouth. Hungarian mothers knew this centuries ago, when they would bite the faces of their infant sons so that they would be better warriors by being ugly and more terrifying to their foes.

CHAPTER 16

TAPPING THE SOURCES OF HUMAN ENERGY

We have learned something about folk who are lazy, perhaps even shiftless. Now let us turn to what will probably prove a more vital topic—the tired worker.

Let those who bewail the passing of “the good old days” take a look back only two decades into the average industrial department. Straining backs and tensed muscles were hard at work ten or even more hours each day. They were doing work that is now almost without exception done by conveyors, tubes, hoists, cranes, and small lift trucks. These machines which have taken over onerous and wearying work, done formerly by sweating workers, have reduced hours, eliminated worry about possible rupture, increased quantity, and indirectly increased quality by having a more alert and less fatigued group of workers in the shop. It is very likely, also, that home conditions have been bettered, since a worker who is dead tired is not a pleasant fellow to live with.

In the adoption of these drudgery-saving machines America probably leads the world. The conservation of worker strength has more than humanitarian justification; almost invariably it yields an increase in output or quality, or results in savings in materials. As an illustration of the savings in materials take the recent case of a restaurant in a large department store. The expense of broken table china was eating up profits, in spite of the fact that they were using “battleship” china of great thickness, in the belief that china of this weight was less likely to be broken. But a few observations indicated that since there was a hard tiled floor throughout the restaurant and the kitchen, when a dish or a tray of dishes fell to the floor, breakage was

inevitable, regardless of the strength of the china. Most breakages occurred, as would be expected, late in the day.

A tray filled with battleship china is rather heavy, and carrying it any distance to the kitchen fatigues the arm muscles rather quickly. A tray of lightweight china is not so fatiguing to carry. A change to the lighter weight, as was recommended, immediately resulted in a paying decrease in breakages. Besides, the food served on the more delicate china was more appealing, to the female clientele of the restaurant at any rate. Later, changes were made in the layout of the restaurant, so that the distance for carrying trays was greatly reduced, and along with this reduction in walking distance went a reduction in fatigue and breakages.

The increasing use of aluminum, of pressed steel, of molded composition parts might be expected to yield a similar saving. As these nonbreakable parts are being substituted for other, heavier parts which are also non-breakable, breakage records might not be expected to show any difference as a result. In one plant with which I am familiar, however, the afternoon output has been proportionately greater since the substitution of the lighter weight materials than when castings of heavy gray iron were used. An afternoon slump is an anomaly. Nature did not plan on such a slump. It should always be looked upon as being caused by fatiguing methods of work. It is not due to human laziness, because it shows up among pieceworkers as well as among workers by the day.



All body machinery is predominately chemical and physical. Perhaps some day we shall understand it and guide it better in electrical terms, since experimentation in general indicates that the chemical and physical often resolve themselves into more basic electrical phenomena. There is a vast supply of chemical and physical knowledge already available about these essential muscle machines, which is sufficient in itself to offer us much practical

understanding of our muscles. A practical mastery of muscle, however, requires more than complete chemical knowledge.

The foremost authority on muscle, Dr. Archibald V. Hill, the distinguished London scientist, has recently pointed this out. "With this machine intelligent human beings have to work," he says, "aided by moral qualities of courage and resolution. Some will work their machinery better than others. Some will fail by lack of the necessary mental qualities, by lack of the necessary skill; some will neglect to keep their machinery in order. Others will fail for lack of resolution." And Dr. Hill knows what he is talking about in more than a dry scientific way. He himself is no mean athlete.

Knowing the dynamics of muscle chemistry will not provide the courage and resolution and perseverance, but it will make the courage more fruitful.

It should give courage, for instance, to learn that a trained runner develops about seven horsepower of mechanical energy from the chemical transformations in his active muscles.

It should give still more encouragement to discover that one of the most efficient engines in the world is that of our muscles. Steam engines with modern condensers have an efficiency of about 15 per cent, if the engine is a good one. This means that for every 100 calories of fuel energy consumed under the boilers, the engine returns only about 15 calories of productive mechanical energy. Gasoline engines have an efficiency of from 20 to 25 per cent. Diesel engines have an efficiency of 20 to 35 per cent. The trained athlete may have a muscular efficiency of more than 40 per cent!

The fuel burned by muscles is in the form of a sugar known as glycogen. Each contraction or twitch of a muscle uses up some of this glycogen. The fire draft which supplies oxygen to the muscles so that they can remove the used-up glycogen is the red blood cells. These take up oxygen from

MEASURING THE ENERGY REQUIRED TO WORK

The *first step* in measuring the calories of energy spent in working under different conditions is to attach the mask over the worker's nose and mouth. Valves in the mask permit room air to be breathed in, while all exhaled air is shunted into the corrugated tubing which leads into another room. To prevent the slightest leak, the surface of the mask in contact with the face is coated with liquid adhesive. (The typist is Miss Elsie Keller, former champion speed typist.)



The *second step* is collecting the exhaled air in a large bag as it is breathed out by the worker. A small sample of the exhaled air is taken from the bag to be analyzed. After the analysis is completed, the remainder of the air is passed through a meter. Here Dr. Thomas Turino is expelling the air from the bag through the meter which Robert Enslin is reading.



The *third step* in finding how many calories are spent in working is to analyze the air exhaled from the worker's lungs for oxygen and carbon dioxide, as Dr. Thomas Turino is doing here. When the percentage of these in the exhaled air is compared with that breathed in in the room air, it shows how much oxygen the worker consumed per minute and how much carbon dioxide was given off. A few simple computations from these data tell the calories per minute burned by the worker's body.



the air in the lungs and carry it throughout the body, and a working muscle which needs oxygen takes it up from these red cells automatically, as an automatic thermostat opens and closes the furnace drafts at home.

A hard-working muscle will require more oxygen than can be brought to it by the red cells. But unlike the basement furnace, the muscle does not stop at once; it keeps on working in a fatigued condition and runs up what is called an oxygen debt. It cannot long keep on with this, but this sort of thing happens every day, when we run to catch a train or to answer the telephone, when we are doing the week's washing, or when we dance some of the modern dances. Whenever one's working rate changes, it takes some two minutes for the rate of oxygen intake to adjust itself to the new demands. The oxygen follows, but is not a cause.

Two apparent poisons are given off when muscle engines work. The glycogen becomes split into lactic acid and carbon dioxide. Lactic acid is produced every time a muscle works. The faster it works, the more there is of this acid. If the muscle is working especially hard, the acid is produced more rapidly than it can be removed. It accumulates. A hard-working man is more acid than a resting man.

Only one arm may be in use, but if it is exercised strenuously enough, so much lactic acid will be accumulated that it will be carried by the blood to remote parts of the body. If it accumulated solely in the arm muscle, it would quickly put a stop to activity; but when it is diffused to other muscles in the body, it may make them tired. So, exercise of one part of the body may make the entire body tired.

There is a bright side to this picture, however. When the lactic acid is carried to lodge in other muscles, there is more oxygen available to counteract it than as if it remained in the arm. Recovery from a tired arm may

occur actually in the legs! This is something that cannot happen in the steam engine.

Another miracle makes human muscle more efficient than a steam engine with condensers for bringing the exhaust steam back into the boilers. The oxygen acts upon the lactic acid to restore much of it back into glycogen. As much as three-fourths of the glycogen may be restored.

Muscles in different parts of the body vary in their ability to re-form glycogen, and in their ability to withstand amounts of lactic acid before they stop working. Some of them do more work while consuming less glycogen. Quickly moving muscles require more energy from the body than do slowly moving muscles. The red muscles are more efficient than the white or pale muscles.

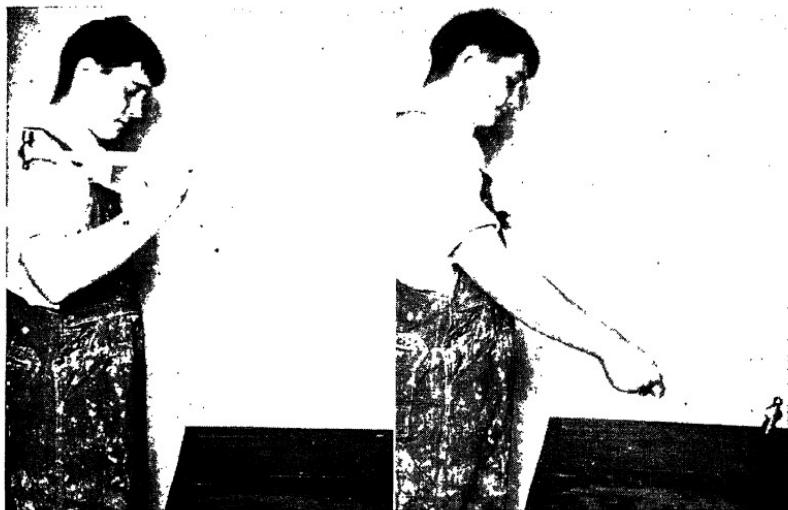
Muscles of warm-blooded animals are capable of twice the work of those of cold-blooded animals. Insect muscles are even more powerful, in proportion to their size—an apparent exception to slow movements' being more efficient than quick movements. How great is this difference between warm- and cold-blooded animals can be seen from a comparison of the strength per unit of size of frog and human muscle. Per unit of mass, the human muscle is from two to ten times more powerful.

Regardless of the relative power of different kinds of muscles, it is now obvious how deep breathing increases the oxygen available for combating lactic acid. The increase in available oxygen in deep breathing is slight, but tremendously helpful. If our atmosphere were to change so that there would be more than the 20 per cent of oxygen of our present atmosphere, it is very probable that the resistance of muscles to lactic acid fatigue would be increased. This is proved by actual experiments in artificial atmospheres containing as much as 50 per cent oxygen.

To know how well the blood can take up oxygen from the air breathed into the lungs is also important in deter-

How to Use Psychology in Business

mining how well the muscles can fight lactic fatigue. Trained athletes carry more oxygen in their blood than ordinary persons do. Nature can be helped by training. In some diseases, such as anemia, the oxygen-transporting



Aim. then throw

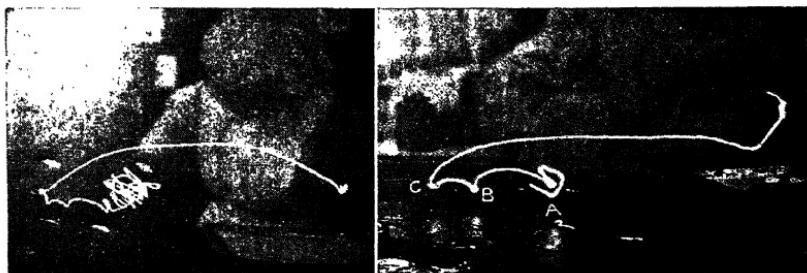
Ballistic movements are the least fatiguing. It is not the length of the movement, but the kind, which causes much avoidable fatigue. Aim, then throw is the ballistic movement. Muscles are in active contraction only in the first part of the movement, and they coast the rest of the way. Sweeping movements can be substituted for shorter angular ones and the muscles aimed and thrown, rather than being under continual tension. In other words, imitate the sweeping curves of the orchestra conductor's baton. These ballistic movements are the most rapid, the most accurate, and will be less likely to cause muscle or occupational cramp. A brisk walk is ballistic. When the coach says, "Now loosen up—relax!" he is trying to get his charges in the frame of mind which promotes ballistic movements. Even fine movements can be made ballistic, as in Spencerian handwriting.

power of the blood is lowered. This makes some persons tire quickly.

The oxygen debt may take thirty minutes to be completely paid off after moderate exercise. After running 100 yards at top speed, it may take an hour of rest for the oxygen debt to be paid. Even the trained runner has about four grams of lactic acid liberated by his muscles every second. It is little wonder that a race is exhausting.

Tapping the Sources of Human Energy

Fatigue recovery is further helped by an unrestricted circulation. No laboratory experiments have been conducted upon the effect upon fatigue recovery of wearing a tight belt or corset. Dr. Lindhard, however, has found that in exercises where the body is supported with the arms bent on gymnasium rings, the oxygen debt is increased because the blood supply to the active muscles in the arm



Jerky movements

Ballistic movements

Using ballistic movements in covering chocolates. These photographs were taken of workers who had a small electric bulb on their hand. The camera was left open from start to finish of the dipping of one chocolate, and the small light traced the path followed by the workers. On the left, note the many jerky movements made by an experienced woman worker; the long move across the picture is where she carried the completely dipped chocolate to the storage tray on her left. The other photograph shows the ballistic method developed for this work by an industrial psychologist. Note that there are only two pauses, at B and C (A is the starting point). The changes in direction at B and C are not abrupt, but are in the form of a curve—the motion was not stopped but the direction changed by curving after the fashion of the orchestra conductor's baton. (Photographs from Industrial Fatigue Research Board, Great Britain.)

is cut down by the pressure on the rings. Running is one of the most efficient uses of muscles, since the entire circulation is stimulated and the flow of oxygen carrying blood to all the muscles is facilitated. Working in a position which restricts the flow of blood acts in a way similar to the pressure of the gymnasium rings. Sleeping in cramped position, as in an attempt to keep warm, comes under the same category. The heart is doing a great deal of work in pumping out seventeen gallons of blood every minute. Posture or dress may offset this record that the heart is making every minute of our lives.

Common drugs, such as caffeine, have unusual effects upon muscles. After a muscle is stimulated for a few seconds in a dilute solution of caffeine, it has a typical contracture, just as if the muscle were given a shock every few seconds. It acts to release, slowly but continually, the series of chemical events which normally take place rapidly. The muscle may be given a brief stimulation by caffeine and the contractures appear several hours later.

Various methods of using muscles yield varying efficiencies. In climbing stairs, for instance, the most efficient

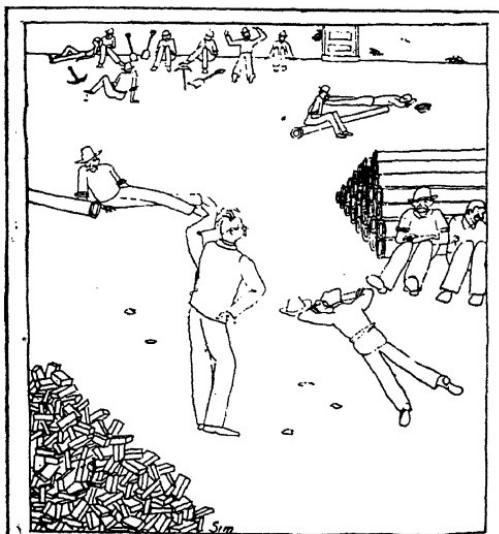


Ballistic movements applied to handwriting. The top line is written in ballistic movements, the lower line in the more fatiguing "stop and go" movement. Both lines are spelled the same, but the lower line is in German script.

rate is one step about every second; every 1.2 seconds, to be exact. This can be gauged individually, without the help of a stop watch, by counting: "One—Mississippi; two—Mississippi; three—Mississippi; etc." This comes close to indicating a second on each count. Stair climbing is actually about fifteen times as energy consuming as covering the same distance on the level. Even stopping takes energy. The track athlete in stopping expends energy equivalent to running about another five yards at top speed.

Shape and arrangement of muscle are important. The speed of an animal does not depend upon size so much as it does upon the shape of the muscles. The race horse and the whippet, for instance, are widely different in size; but they have much the same shape, and both are capable

of a speed of about forty miles per hour. There is, too, a great difference between the size of the kangaroo and that of the grasshopper, but both have the same long-jumping capacities. An ordinary dog and an ordinary



—Courtesy "Banter" of Colgate University.

[Terrible Predicament of the Industrial Psychologist Who Lost His Whistle After Blowing for the Rest Period.]

horse can jump to about the same height. In size the two are vastly different, but in shape, closely similar.

In an increasingly large number of business plants, rest pauses are now established as a means of counteracting the accumulation of fatigue products and thus preventing the afternoon slump. When wisely used, these are undoubtedly beneficial to both worker and plant, but usually better methods of employing human strength are needed, rather than rest. If human muscles were properly used, rest pauses would be needed only on the heaviest labor or on high-speed assembly or repetitive work.

A textile mill with an eight-hour day, for instance, had a policy of hourly rest pauses of five to ten minutes throughout the plant, the longer pauses of ten minutes coming at ten and three o'clock. These were little more than a gesture, since they were too short to allow any real rest, and in many instances there was not time for the girls even to leave their workrooms. A change to a fifteen-minute pause at 9:30, a ten-minute pause at 10:45 and



It is not the work which fatigues this man; it is the position in which he works.

2:30, followed by another fifteen-minute pause at 3:45 consumed the same time in rest and its loss of productivity, but piece-rate earnings increased 10 per cent under the new regime.

While this illustrates that some rest-pause schemes are little short of foolhardy, we should also wonder why the firm did not gradually change to the American-type frame, which does not require stooping. Stooping is very fatiguing, and most of the older frames are built so that the worker does little but stand, walk, and stoop; the stooping is more fatiguing than the walking and standing combined. But we are running ahead of ourselves. Rest pauses during the work spells, and an actual shortening of the working day, almost invariably increase the output of the workers, *after* they have adjusted their muscles and work habits to the new tempo made possible by the

reduced accumulation of lactic acid. But the rest pauses need to be worked out carefully: a too-short pause is of no use; neither is one that is too long, at least so far as output is concerned.

As a matter of fact, it is a maxim of modern industrial psychology that when a reduction in manufacturing hours does not bring about an increase in output, there is something radically wrong in worker morale or in working conditions or in plant layout.

Production actually increases when the hours of work are shortened, for the patent reason that men and women become tired. There is a limit, set by inexorable nature, on human effort. Long hours of work usually defeat themselves by giving an inadequate time during the course of the work week for the sodium lactates, which are the "fatigue toxins," to be dissipated from the muscles of the worker. Rest is needed to allow these accumulations to disappear. Unless rest is taken, fatigue accumulates and Tuesday's production is less than Monday's; Wednesday's, less than Tuesday's; and so on through the week.

Fatigue thus not only accumulates during the day, but when the allowance for recuperation during sleep and off hours is inadequate, it accumulates from day to day. The haggard, colorless, spiritless appearance of many mill hands is due more to this than it is to dust or fumes in the factory.

Overtime work has always been known to be uneconomic to the manufacturer, for this same reason that less and less is produced each additional hour. There is an industrial viciousness about even occasional long hours that is not generally realized, for stereotyping of work is the result. Stereotyping of work is due to the worker's habits of manipulation or operation having been slowed down through the one especially long spell, and this slowed rate being automatically adopted by his nervous organization as standard. Thus the employee who has been regularly working on an eight-hour day and who one day works

How to Use Psychology in Business

twelve hours, has his hourly rate of production slowed down for a number of days, even though he may have been back on the eight-hour schedule the next day.

This same stereotyping, or the habit of working at a certain speed or level, also makes the rate of adjustment slow when hours of work are decreased. The increased hourly production does not show itself the first day, nor the second, nor even the first week. The work habits, unfortunately, have been conditioned to a certain subpar rate by a few extra long days, or by a too long regular workday, and it is often only after as much as six months that the improved hours and more complete recuperation from the long accumulated fatigue makes it possible for the new work habits to show themselves. These new work habits, which give more production per hour, are not the result of pressure or prodding, but are a natural and practically invariable expression of human nature's powers themselves, unaided and unforced by any speeding up of machinery.

A short-lived fallacy tried out early in the World War was the use of long hours in munitions plants. It was short-lived because records gathered over a period of a few months showed that total output was 19 per cent greater on a 55.5-hour week than on a 66.7-hour week.

In manufacturing munition fuses, 108 fuse bodies were made per hour when a 66-hour week was worked, and the output rose to 131 fuse bodies per hour when there were only 54 hours of work each week. When Sunday work was discontinued and the weekly hours reduced to 47, the output rose still higher to 169 fuse bodies per hour—an 11 per cent increase over the output with the same workers, in the same plant, and with the same equipment, when working 66 hours weekly.

The reason why the improvement does not take place immediately is well illustrated by an unusual instance from a steel plant, where an abnormal time was taken for old stereotyping of work habits to be modified. Steel

smelters had their day reduced from 12 to 8 hours. Two months later, there was a slight increase in hourly output, but it was not until 13 months after the reduction in work hours that a new level of stereotyping was reached, when production became 18 per cent better than under the longer hours.

Experience in a tinplate plant is also revealing. Two months were needed for output per hour to increase when hours were reduced from eight to six. But—and this is highly important—hourly output dropped immediately some time later, when hours were raised to the old standard of eight.

Since we are living in the highest development of the machine age, many mistakenly believe that electricity and machine speeds determine hourly production. There are literally thousands of records showing that this is not as true as it might seem at first thought. The skill and fatigue of the worker are still the bottleneck that determines production, even with such marvelous machine developments as automatic spinning and weaving frames.

What a ten-thousand-dollar automatic machine accomplishes is usually determined by a twenty-dollar-a-week worker. The label "automatic" and the whirl of gears has misled many to think that the role of the worker was negligible. In truth, the worker is probably more important in this machine age than in the old days of purely hand labor, since he is now working through a machine that is claimed to do, let us say, the work of ten men. As the worker is slowed up through long hours, he is slowing up not one man, but the ten men concealed in the clanking rods and bearings of his machine.

When factory hours are lessened, not only is money saved in the labor costs, but there is also a saving in power, light, and for some operations, heat. Shorter hours also bring a saving in absence from work, in accident rates, and in spoiled work. However, there are limits to the shortness of working hours, below which these gains can

be lost. A one-hour day, for example, would probably be highly extravagant, although it would provide brief work for great numbers. The bare facts, based on records from hundreds of factories in recent years, suggest almost conclusively that a forty- or even a fifty-five hour week will not of itself provide much new employment. The elasticity of human beings will more than take up the slack in hours worked for this rather limited reduction in working hours.

CHAPTER 17

EATING FOR WORK AND FATIGUE

Glycogen, the fuel used by the muscle, is a carbohydrate. For a long time scientists were in controversy regarding whether fats could be used as muscle foods. It is now apparent that the body may transform fats into carbohydrate. But experiments by Krogh and Lindhard have demonstrated that muscular efficiency is highest on a diet that is predominately carbohydrate. This has been confirmed as the primary fuel of muscle by Dr. Furusawa.

Foods in which carbohydrate content predominates are beans, barley, bread of all kinds (especially toasted), corn meal, crackers, dates, farina, grapes, butter, hominy, honey, macaroni, molasses (cane), oatmeal, prunes, raisins, rice, shredded wheat sugar (100 per cent carbohydrate), wheat, and zweiback.

Foods may enter into muscular efficiency in another way. The oxygen-carrying power of the blood seems to be dependent upon the presence of iron. Foods especially rich in iron are almonds, beans, dates, eggs (especially the yolks), figs (dried), hazelnuts, lentils, meat (lean beef), oatmeal, prunes, raisins, rye, spinach, and whole wheat.

It is well recognized that in the last hour or two of the work day there is a marked falling off in worker output. This varies to some extent with the type of work, but it is practically a universal occurrence.

There are several explanations for this falling off in production, and practically all of these explanations have some validity under one circumstance or another. It is most reasonable to believe that this "last-hour slump"

How to Use Psychology in Business

is due to a number of causes rather than to any one single cause.

Of most significance in connection with the present work, however, are the accumulation of sodium lactates as by-products of the utilization of blood sugar, or glycogen, in supporting the muscular activity incidental to the work, and especially the gradual depletion of the readily available glycogen before the shock point is reached which stimulates the liver to release its reserve store of glycogen.

The carbohydrates furnish the primary fuel used by muscles. To be used by the muscles the carbohydrate must be converted into glycogen. All carbohydrate foods have to become glycogen before they can be used by the body to sustain work and coordination.

Glycogen is formed, under normal conditions, from the carbohydrates taken in as food; but not all carbohydrates lend themselves with equal readiness to being converted by the human system into muscle-feeding glycogen. In forming this special sugar, the directly assimilable carbohydrates are given preference by the organism; and it does not appear possible for the liver to manufacture glycogen out of fats, although in cases of a physiological crisis this organ can convert some proteins into glycogen.

Some carbohydrates leave the stomach sooner than others, and thus become available more quickly for emergency service. Maltose, or malt sugar, is one of the quickest to leave the stomach, be changed into glycogen, and be carried by the blood stream to the muscles in need of fuel. Maltose hydrolyzes into two molecules of dextrose, while sucrose (cane sugar) hydrolyzes into one of dextrose and one of levulose. Dextrose (right-handed sugar) is converted into glycogen more easily than is levulose (left-handed sugar), giving maltose an advantage over sucrose.

A warm milk drink, rich in the carbohydrate which most quickly becomes glycogen, such as maltose, is quickest to relieve the *bona fide* fatigue that is due to what might

be called a temporary fuel embargo on the glycogen available to support the work being done.

Muscle normally contains from one to 4 per cent of glycogen, while the liver contains from 7 to 19 per cent. The starving of laboratory mammals causes a disappearance of glycogen from the liver, so that only traces are left at the end of a week. However, if muscular exercise is combined with withdrawing the food supply, at the end of the second day the blood sugar reserve of the liver is quite depleted.

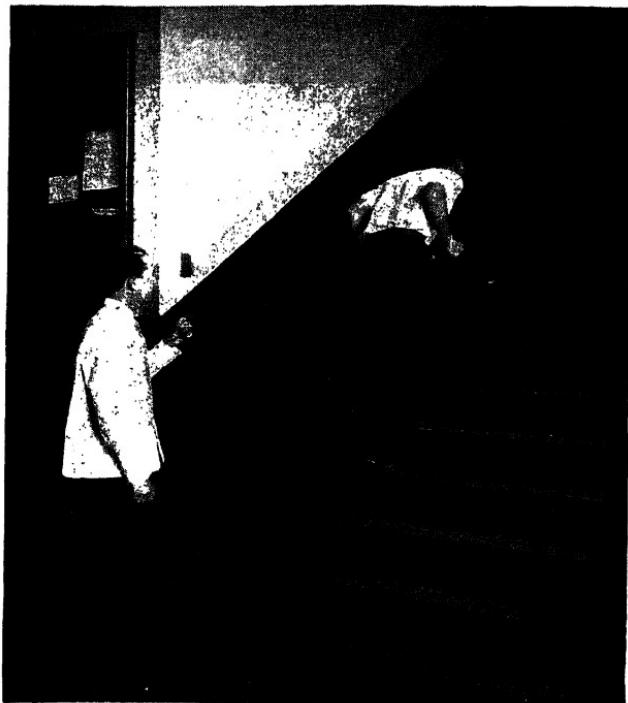
The total economy of the individual is preponderantly affected by these conversions of sugar into work. Muscle tissue constitutes about 42 per cent of the body weight of the average adult. But this tissue has so important a role in life that it produces nearly half of the metabolism of the body at rest, and three-quarters of the total bodily metabolism when engaged in moderate activity.

Some recent experiments have measured the effect of depleting glycogen, and the benefits of eating carbohydrates in preparation for work. One experiment on twelve healthy young men, divided into two squads of six each, was reported in the *Medical Review of Reviews* for June, 1930. Five standard tests of psychological functions were given to these two groups, just before the subjects climbed up and down two flights of stairs; the same tests were repeated immediately after they had completed the stair climbing.

On alternate experimental days one squad was given a drink containing 2.3 ounces of cane sugar forty minutes before the exercise, while the other squad was given a control drink with the same sweet taste but containing no sugar.

In all the tests, the sugar more than offset the fatigue caused by the stair climbing (remember that the energy consumption in stair climbing is about fifteen times as great as for covering the same distance on a level surface).

Without sugar the speed and accuracy of eye-hand coordination, general muscular coordination (body sway), lag of attention, and mental addition were impaired by the moderate exercise. With sugar there was either no impairment or actual improvement in performance after the same exercise.



Stair climbing, which consumes energy fifteen times as rapidly as walking on the level, is widely used in the laboratory study of fatigue.

The benefits of ingesting the sugar solution in preparation for the exercise were most marked in the tests of coordination and least marked in mental addition.

These results were obtained in spite of two theoretical handicaps. First, the sugar solution was taken less than an hour after the noonday meal, when the stomach was still filled. Second, the exercise was taken only forty

Eating for Work and Fatigue

minutes after drinking the solution. This second handicap means that not all of the 2.3 ounces of sugar had been assimilated into the system, since a period of about two hours is required for the stomach to become completely empty of sugar, in spite of the fact that sugar is one of the most quickly absorbed foods. It has been estimated that



Body sway, an index of general coordination of muscle and nerve, is ascertained by the ataxiograph. The pencil inverted on the subject's head writes a record of his swaying on the sheet of paper on the bottom of the adjustable platform.

only about one ounce of the sugar was available for replenishing the glycogen supply at the time of the exercise.

The experiment on stair climbing, just cited, used instrumental measurements which are difficult to translate into terms of everyday experience. The worker does not consciously experience "lag of attention" but simply finds it difficult to keep his mind on the task at hand. A further test of the bearing of the immediate carbohydrate supply in the diet on fatigue was accordingly arranged, with ten young men as subjects. In place of instruments for measuring the effects, if any, a data blank was provided for

A fatigue inventory

	<i>Yes</i>	<i>No</i>
1. Have you had transient or mild headaches?.....	<input type="checkbox"/>	<input type="checkbox"/>
2. Did you have a mild tendency to yawn, or spells of actual yawning?.....	<input type="checkbox"/>	<input type="checkbox"/>
3. Was your appetite poor?.....	<input type="checkbox"/>	<input type="checkbox"/>
4. Was it an effort to move your muscles?.....	<input type="checkbox"/>	<input type="checkbox"/>
5. Did you feel drowsy?.....	<input type="checkbox"/>	<input type="checkbox"/>
6. Did you have a tendency to nod your head?.....	<input type="checkbox"/>	<input type="checkbox"/>
7. Did you perspire without exertion to cause it?.....	<input type="checkbox"/>	<input type="checkbox"/>
8. Did you feel faint or hazy any time?.....	<input type="checkbox"/>	<input type="checkbox"/>
9. Was there a suggestion of circles under your eyes?.....	<input type="checkbox"/>	<input type="checkbox"/>
10. Did you have a taste in your mouth?.....	<input type="checkbox"/>	<input type="checkbox"/>
11. Did tobacco, candy, or food taste flat?.....	<input type="checkbox"/>	<input type="checkbox"/>
12. Did some of your muscles twitch from time to time?....	<input type="checkbox"/>	<input type="checkbox"/>
13. Were you unsteady or wobbly on your feet any time?..	<input type="checkbox"/>	<input type="checkbox"/>
14. Were you slouchy in sitting or standing?.....	<input type="checkbox"/>	<input type="checkbox"/>
15. Did you get short of breath on ordinary exertion?.....	<input type="checkbox"/>	<input type="checkbox"/>
16. Were you sick to your stomach or did you have a tendency to belch food?.....	<input type="checkbox"/>	<input type="checkbox"/>
17. Did you want to close your eyes from time to time?....	<input type="checkbox"/>	<input type="checkbox"/>
18. Did you misplace things?.....	<input type="checkbox"/>	<input type="checkbox"/>
19. Did you have trouble remembering what had just been said to you?.....	<input type="checkbox"/>	<input type="checkbox"/>
20. Did you forget engagements, chores, phone calls, etc.?...	<input type="checkbox"/>	<input type="checkbox"/>
21. Was it difficult for you to keep track of the day or date?.	<input type="checkbox"/>	<input type="checkbox"/>
22. Did you forget what you had read during the day?.....	<input type="checkbox"/>	<input type="checkbox"/>
23. Did you have difficulty recalling facts (or people) which you know well?.....	<input type="checkbox"/>	<input type="checkbox"/>
24. Were you careless during the day?.....	<input type="checkbox"/>	<input type="checkbox"/>
25. Did you feel like <i>not</i> talking?.....	<input type="checkbox"/>	<input type="checkbox"/>
26. Was it difficult for you to relax?.....	<input type="checkbox"/>	<input type="checkbox"/>
27. Was it difficult for you to get yourself <i>to start</i> to read or write or do other mental work?.....	<input type="checkbox"/>	<input type="checkbox"/>
28. Was it hard for you to get yourself <i>to start</i> to do physical work?.....	<input type="checkbox"/>	<input type="checkbox"/>
29. Did you <i>hesitate</i> to get up when sitting in a chair?.....	<input type="checkbox"/>	<input type="checkbox"/>
30. Did you <i>want</i> to change from one job to another before the first was finished?.....	<input type="checkbox"/>	<input type="checkbox"/>
31. Was it difficult for you to think?.....	<input type="checkbox"/>	<input type="checkbox"/>
32. Did you think you saw or heard things that were not present?.....	<input type="checkbox"/>	<input type="checkbox"/>
33. Did peculiar or bizarre new ideas occur to you?.....	<input type="checkbox"/>	<input type="checkbox"/>

	Yes	No
34. Were you bothered by ideas coming into your head when you wanted to do something else?.....	<input type="checkbox"/>	<input type="checkbox"/>
35. Did you have any noises, such as buzzing, in your head?.....	<input type="checkbox"/>	<input type="checkbox"/>
36. Was there any itchiness or creepiness on your skin?.....	<input type="checkbox"/>	<input type="checkbox"/>
37. Did any objects blur before your eyes, or did things look misty at times?.....	<input type="checkbox"/>	<input type="checkbox"/>
38. Did you have difficulty hearing, or did you have to listen closely to remarks made to you?.....	<input type="checkbox"/>	<input type="checkbox"/>
39. Did you laugh at almost everything?.....	<input type="checkbox"/>	<input type="checkbox"/>
40. Did you feel blue or downhearted for a time?.....	<input type="checkbox"/>	<input type="checkbox"/>
41. Were you <i>irritated</i> by some things, such as noise or lights?.....	<input type="checkbox"/>	<input type="checkbox"/>
42. Were you inclined to swear?.....	<input type="checkbox"/>	<input type="checkbox"/>
43. Did you want sympathy?.....	<input type="checkbox"/>	<input type="checkbox"/>
44. Were you impatient?.....	<input type="checkbox"/>	<input type="checkbox"/>
45. Did you want to avoid singing or playing?.....	<input type="checkbox"/>	<input type="checkbox"/>
46. Did you get rattled or confused a time or two?.....	<input type="checkbox"/>	<input type="checkbox"/>
47. Were you jumpy or fidgety at all?.....	<input type="checkbox"/>	<input type="checkbox"/>
48. Did you lose your temper at any time?.....	<input type="checkbox"/>	<input type="checkbox"/>
49. Did you want to be alone?.....	<input type="checkbox"/>	<input type="checkbox"/>
50. Were you ill at ease or hesitant at times?.....	<input type="checkbox"/>	<input type="checkbox"/>
51. Did you have a tendency to stammer or stutter or get mixed up when talking?.....	<input type="checkbox"/>	<input type="checkbox"/>
52. Did time drag for you?.....	<input type="checkbox"/>	<input type="checkbox"/>
53. Did you have difficulty <i>concentrating</i> on work you were trying to do? Did you have to exert yourself to keep your mind from wandering?.....	<input type="checkbox"/>	<input type="checkbox"/>
54. Were you <i>distracted to other things</i> by noises, lights or talking?.....	<input type="checkbox"/>	<input type="checkbox"/>
55. Did you have trouble keeping your eyes on the work you were doing?.....	<input type="checkbox"/>	<input type="checkbox"/>
56. Did you do things without being aware of it?.....	<input type="checkbox"/>	<input type="checkbox"/>

Although ill health may at times give a basis for a "Yes" answer, under normal conditions the "Yes" answers on this list are signs of fatigue. The more there are of this sort of answers, the less is the inclination to work. These are feelings of fatigue.

reporting on each of fifty-six recognized ways in which "that tired feeling" is experienced.

Cross-country hikes of eight miles over rather hilly country were taken by these ten subjects. The total fatigue signs normally resulting from such a hike are about the

equivalent of those caused by going without a night's sleep, although of a somewhat different character.

The hikes were taken under two conditions. First, the subjects were supplied with candies containing sugar and glucose, which they ate liberally without the exact quantity's being measured. Second, on other hikes they were given candies which were sweetened but contained no



Strength of grip is measured by the hand dynamometer. The strength of other groups of muscles may be determined by similar instruments.

sugar and only very small proportions of carbohydrates. Comparing their feelings of fatigue after hikes under these two conditions of diet will indicate the role of an apparently adequate supply of dietary sugar in offsetting some of the feelings of fatigue.

After the hikes during which no sugar had been consumed, the squad showed 34 per cent more fatigue signs. In other words, the ready supply of so-called energy food had eliminated about a third of their feelings of fatigue.

Fatigue symptoms which were present in this group after the hikes without sugar, and which disappeared

Eating for Work and Fatigue

following the hikes when the carbohydrate was consumed, are as follows:

- Perspiring without exertion to cause it
- Itchiness or creepiness on the skin
- Wishing not to talk
- Difficulty in relaxing
- Difficulty in remembering
- Effort needed to start to do mental work
- Faintness or "haziness"
- Jumpy and fidgety feelings
- Flat-taste in tobacco and food

It should be noted that several of the above ways in which "that tired feeling" is manifest could readily be thought of from the armchair as due to "poor will power" or to the need for thought control. The conditions of this experiment, however, were such as to indicate definitely that these feelings originated primarily from an inadequate supply of materials for conversion into glycogen, as the reserve supply immediately available in the muscle tissue itself and in the liver cells was being consumed by the exercise.

It will be recalled that in the case of laboratory animals a complete depletion of the glycogen reserve of the liver appears in two days if no food is consumed and moderate activity is obtained. This would suggest that a diet of less than the required caloric value, if continued for any appreciable time, would lead to effects similar to those noted in the experiments which have just been outlined.

During the World War the Nutrition Laboratory of the Carnegie Institution conducted chemical psychological experiments, which were designed to assist in readjusting to the world-wide curtailment in food sources, and which yielded significant data along this line.

Balanced but curtailed diets were experimented upon. One squad of ten subjects received 3,000 calories of food

daily, the other only 1,800 calories daily, through a period of two months.

Mental-addition tests showed that the full-ration squad gained through practice and doubled their accuracy in the first month, while the reduced-ration squad had increased their accuracy only half at the end of two months. The reduced-ration squad, also, made 50 per cent more errors than the full-ration squad at the end of the second month. Similar differences in memory appeared between the squads, but the reduced-ration squad actually deteriorated in this function during the course of the second month. Sensory discrimination of differences in tuning-fork pitch and sensitivity to electrical currents were adversely affected in the reduced-ration squad.

The effects shown by these three tests, which deal largely with so-called brain functions, are probably to be explained on the basis of ability to give better attention due to the better physiological condition of the full-ration squad, rather than to a direct impairment of brain tissues in the reduced-ration squad.

In the tests of physical performance the effects were more striking.

In a steadiness test made by tracing with a pencil between two parallel lines, the experimental squad on reduced rations not only made more errors, but showed less improvement in two months' practice than the full-ration squad did in the first month. Strength of grip was decreased 8 per cent by the reduced diet, the left hand being affected more than the right. This difference in the way the hands are affected can be considered as following the general principle that nature strikes at the functions which are not only the most recently acquired in the process of evolution but also the weakest. Speed of eye movement was reduced 5 per cent and speed of finger movement was also reduced by the 1,800-calories diet.

On the chemical side this experiment demonstrated that the body was able to adjust itself so that life was not

endangered, but it is obvious from the results just cited that human effectiveness was seriously reduced.

Most of the meager data regarding the effects of fasting are complicated by a zeal that is more fanatical than scientific among those who are fasting, as well as by the lack of a control: that is, records in tests of the same subjects when not fasting are conspicuous by their neglect.

Such was the case with Agostino Levanzin, a lawyer from Malta, who was a zealous faster. Dr. H. S. Langfeld tested the subject daily through a thirty-one-day fast and found that Levanzin's strength of grip, measured by the hand dynamometer, fell off as the fast progressed. Dr. Langfeld was not able to secure records of the faster's tests during a control period, however, for on the last day of the fast the lawyer developed colic and left the laboratory.

A thoroughgoing study of the effects of fasting has been reported by Dr. John Arthur Glaze. Unfortunately there are not more individuals to be included in this section. Dr. Glaze reports the results of the study of partial fasting for a seventy-seven-day period, by a woman who weighed one hundred and twenty pounds at the start of a fast during which her weight was reduced 10 per cent. Control records for her performance before and after the fasting period were taken.

On her normal diet she could write 2,800 letters per unit of time, but while fasting averaged less than 2,600. This is a loss of almost 10 per cent in speed. Flexibility, measured by the time taken to read a selection backwards, also showed approximately a 10 per cent reduction. Reduced capacity for light work through a twenty-minute period of work at writing letters was also shown. While fasting, production during this twenty-minute period was 10 per cent less the last minute than the first minute, compared with a 5 per cent reduction for the weeks of normal diet.

All of the experiments cited are uniform in pointing to the following inferences in the case of normal human beings living under generally desirable conditions:

How to Use Psychology in Business

1. A decreased general food intake is followed by unfavorable results in so-called mental as well as in physical performance, and these effects are most marked in the physical performance.

2. An increased intake of carbohydrates is followed by a general improvement in mental and physical performance, especially following moderate exercise.

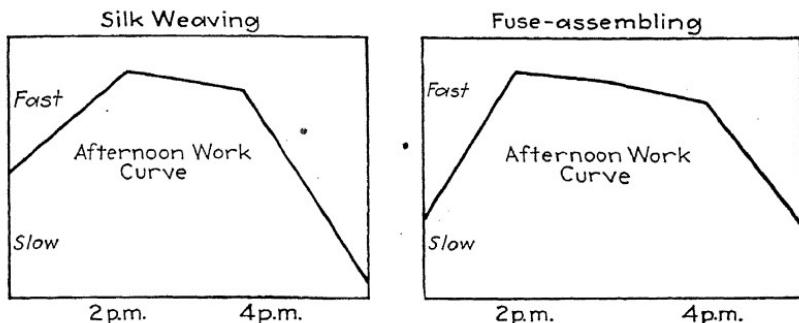
The uniformity of findings in the various experiments, and the chemical knowledge of how bodily activity is maintained throw the burden of proof for other inferences to those who believe differently.

Dr. Howard Haggard in 1935 completed a study which shows that the production of factory workers is increased when they eat five meals a day instead of the conventional three—not five full-sized meals, of course, but still five meals sufficient to keep away the disturbing hunger pangs that occur when the stomach becomes empty because of too long a time between meals.

In the case of those engaged in heavy muscular work, there is not much danger of their getting too much food into their systems. The energy demands of their work quickly use up the calories of energy taken in their food. But in the case of those engaged in light work, most office workers, for example, it is a different story, one to which we turn now.

A characteristic of many production curves for the afternoon work period is that output runs at a low level for an hour or so after lunch, then rises steadily to reach its maximum around three o'clock, following which there is a profound decline during the last hour of work, when the low point of the day is reached. This, almost without exception, is the course for work which involves noticeable mental activity.

The low production during the last hour is usually attributed to fatigue. The low production during the first hour of the afternoon has sometimes been attributed to a necessity for "warming up." In the case of physical work this necessity for "warming up" is a self-evident factor, but in the case of mental work, the explanation is of doubtful validity.



The rise and fall of production during the afternoon. Note especially the low rate of work the first hour of the afternoon. (*Data on women silk weavers from Industrial Fatigue Research Board, Great Britain; data on women fuse-assemblers from U.S. Public Health reports.*)

The majority of those who work in offices or engage in other types of mental work are thoroughly familiar with the fact that they frequently feel mentally sluggish and drowsy during the post-lunch hour, and that this feeling is accompanied by a lowered output of work. To just what this feeling is due, however, and to what extent it actually affects mental capacity and capacity for mental work are not so well known.

Probably all of us have noticed that after eating we feel drowsy, and would much rather stretch out and snooze than pound the typewriter or plan the evening meal or convince a customer. The Spaniard obeys that impulse and takes his long siesta after eating. The Germans, too, have the widespread habit of taking a noontime nap after eating.

One restaurant in Berlin, in fact, has recently capitalized this human weakness of being drowsy after eating. There

have been installed special chairs, which, when a button is touched, are instantly converted into reclining chairs so that the customer can snooze without getting a kink in his neck. To help along this natural drowsiness, if it is natural, the restaurant has black draperies, and the blond, blue-eyed waitresses are dressed in black silk blouses and knickers. Thus does German ingenuity improve the dining couch on which the Romans dozed as they ate long courses of fowl and wine.

Such drowsiness is a precious asset at bedtime, but it will obviously jeopardize one's job or thwart an afternoon's pleasures if one is sluggish for long after the noon meal. Some famous persons have learned this for themselves through sad experience.

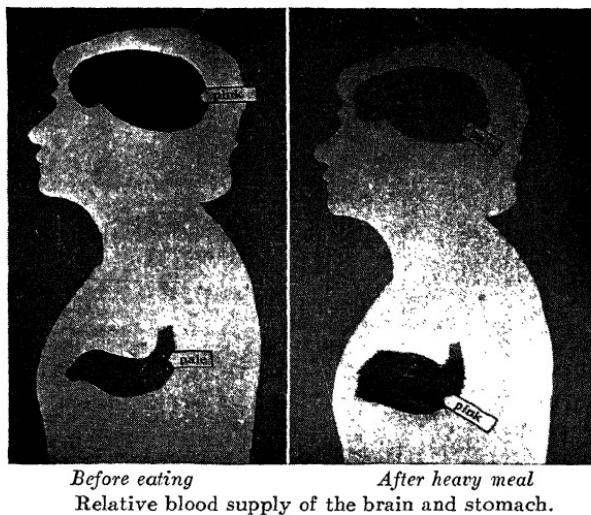
For instance, take Lord George Bentinck, a colleague of Disraeli's. Lord George had been nursing a pet measure through Parliament. He had been making good progress on it, and apparently everything was in line for the measure to pass, if he could only round up a few of his friends to vote his way. To his chagrin, however, the measure was voted down, because on the day it came up he went to sleep after lunch and was absent from Parliament on the very afternoon when he should have been rounding up his friends' votes. After that, Lord George imposed a fast on himself during the sessions when bills in which he was interested were being discussed, and during those periods he would not eat until the day's sittings had been adjourned. That may illustrate not ingenuity, but British strong-headedness.

The records of business concerns in America show that the early afternoon drowsiness takes away from efficiency to a considerable degree. The first hour of the afternoon is a time when office workers, and others whose work is to a large extent mental in nature, not only work slowly but make an unusually large number of errors. And the personal experience of many a debutante shows that early afternoon sluggishness, revealed by going to sleep at the matinee

Eating for Work and Fatigue

or giving her escort the impression that she is dull, slow on the trigger, and generally uninteresting, takes away a considerable amount from the zest of life in America.

Recent experiments show that neither the debutante nor the office worker needs to put up with that "blah" feeling which reduces the early afternoon to nearly a zero value. Sane eating can relieve this condition without going to the



Before eating *After heavy meal*
Relative blood supply of the brain and stomach.

extreme of the German businessman in the restaurant with the reclining chairs and the black-garbed waitresses on the one hand, or of the self-imposed abstinence of Lord George Bentinck on the other hand.



The psychologist is particularly interested in the noon meal because of the fact that eating makes the brain anemic. This cause points the way to the cure. It works in this way. When we eat, an additional supply of blood is needed to help in the processes of digestion. The stomach, like the despot it is, shunts blood to itself from all parts of the body while it is working on a meal.

The bigger the meal, and the harder it is to digest, within limits, the more blood is short-circuited in this fashion to the stomach. Even blood from the skin is drawn to help in these digestive emergencies which take place at mealtime. That is why people are sometimes chilly and like to throw a wrap around their shoulders after a heavy meal. The discomfort of even slight drafts on the skin is due to the stomach's demanding, and taking, blood away from the body surface to work on the food. Touching up with rouge after a large meal has the same underlying cause; the stomach becomes pink, while the skin is made pale.

But the greatest damage to the smooth flow of life is done by the despotic digestive organs' stealing blood away from the inside of the head—from the brain. While this is only a temporary handicap and one which will be relieved, of course, as soon as the main work of digestion is completed, it is nevertheless a very real handicap. Fortunately, it is a handicap which no one need put up with, as recent experiments have graphically demonstrated.

What this brain anemia after eating does, and how it can be easily avoided, was found out in experiments on eight healthy young men. None of the young men had studied psychology, so none of them knew what the experimenters were trying to find out. Otherwise, they might have been biased and have unconsciously performed their work so as to keep in line with their biases. Further to make certain that they would not color the results by prejudice one way or another, they were deliberately given the misleading impression that air conditioning was what was being studied.

The temperature and humidity of air ducts opening into the test rooms were observed from instruments by assistants, and occasionally a pine odor was sprayed in the air to mislead the innocent subjects further. These precautions may appear trivial, but experience has shown that such trickery has to be indulged in to avoid bias and to assure valid findings.

Brain anemia after eating was what was really being studied, although none of the eight subjects knew this. Every day for a month, their noon meal was carefully planned, and all ate the same meal at one large table. On half of the days, the supply of blood to their brains was left relatively unchanged after the men had eaten at noon a dairy lunch of cereal and milk, with variety provided by the addition of different fresh fruits on some days, and a light dessert, also easily digested, such as custard or tapioca pudding or a small baked apple.

The light but nourishing and wholly enjoyable meals on half of the days were ones that would leave their brains, so to speak, in the pink of condition. They did not overeat, but appetite was satisfied, hunger was allayed, and the foods were digested with a minimum of work.

On other days at noon they were given old-fashioned farm dinners, such as would produce brain anemia. There was plenty of food provided, so they usually ate all that they could hold. To make certain that they had a square meal, on some days the double-crust pies they had for dessert were cut into four-sided pieces. Fats—as in the pie crusts—were used to keep their stomachs working for some time, since fats are slow to be digested. In this way pale brains were produced, while the cereal lunches let the brain remain pretty much in its healthy and desirable pink of condition.

After eating, starting at one o'clock, the usual time for office workers to return to their desks, all eight men were given a series of measurements to find out how well they could use their heads after each of the two kinds of meals, which left their brains, so to speak, pink or pale. The same brains were measured each day, but in theory they should be in better working condition on some days than on others.

The differences were surprisingly great. Take mental speed, for instance. This was determined by the Krapelin mental-addition method, where the subjects start with one number, such as 79, and to it add in their head a constant number such as 17, call out the total, which is 96, then add

How to Use Psychology in Business

the same 17 to that total, call out 113, add 17 to that, and so on for 100 successive additions. After a little practice, only about three seconds are needed to carry these numbers in one's head, make the addition, and call out the answer.

The way pink or pale brain condition affected their mental speed was shown in this rather difficult addition

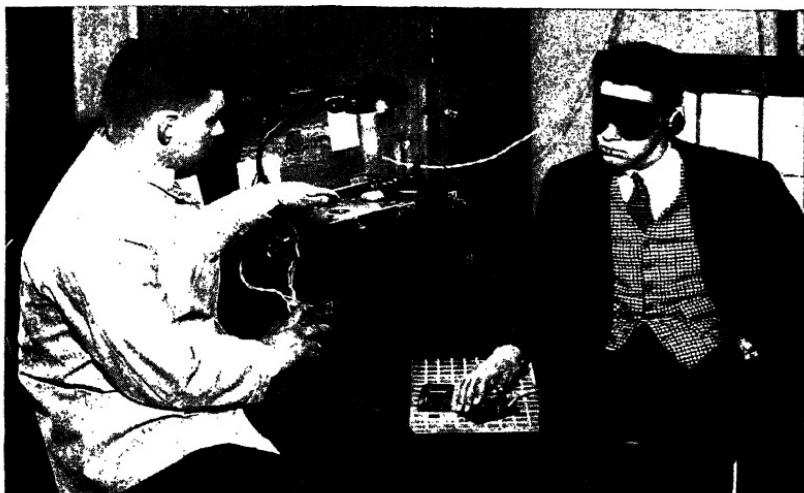


This is used to measure thinking speed. The keys held in the lips start and stop the chronoscope in the box on the table. When the psychologist, on the left, calls out a word it starts the chronoscope recording. The instant the blindfolded subject calls out the first word this makes him think of, the key between his lips stops the chronoscope's recording.

test. After the lunch of a light cereal they made the 100 additions in 6 per cent less time.

Another measure of mental speed was made by the use of the chronoscope, an instrument for measuring reaction time to $\frac{1}{1000}$ of a second. The experimenter would say, "Ready, listen!" Then he would call out the name of some common object, such as "wheel," and the person with the pink or pale brain had to answer as quickly as he could by calling out the name of a part of the object suddenly suggested to him. He would, for example, think of and call out "rim," "spoke," "tire," or "hub" as a part of wheel. At each sitting twenty logically related mental associations

of this sort were measured in thousandths of seconds by the instrument, which was started automatically when the word was called and kept on recording until the subject called out the part he first thought of, when the instrument was automatically stopped. (When given the word "farm," the only part of a farm one city-bred chap could think of, and that after a long interval, was "farmer's daughter");



Measuring lapses of attention: In one room the blindfolded subject listens to the faintest tone he can hear. He uses a key to signal to another room whether he hears the tone or not. The experimenter, on the left, interrupts the tone from time to time as a check on the subject.

but that was not included in the final records.) As with speed of mental addition, this measure of the time for controlled logical thinking was almost 7 per cent faster when the light dairy meal had been eaten.

These two measurements indicate that the brain anemia and its symptoms of drowsiness, following a too-heavy noon meal, slow up mental processes by at least 6 per cent.

The experience of most offices and places where mental work is done shows that efficiency during the first hour of the afternoon is down by just about the same amount. This is probably not a coincidence, but a simple matter of

cause and effect. Through senseless diets, people eat themselves out of work as well as out of shape.

Overeating appears by these new data to affect mental accuracy more than it does simple speed. On the light-meal days, for example, the young men were 25 per cent more



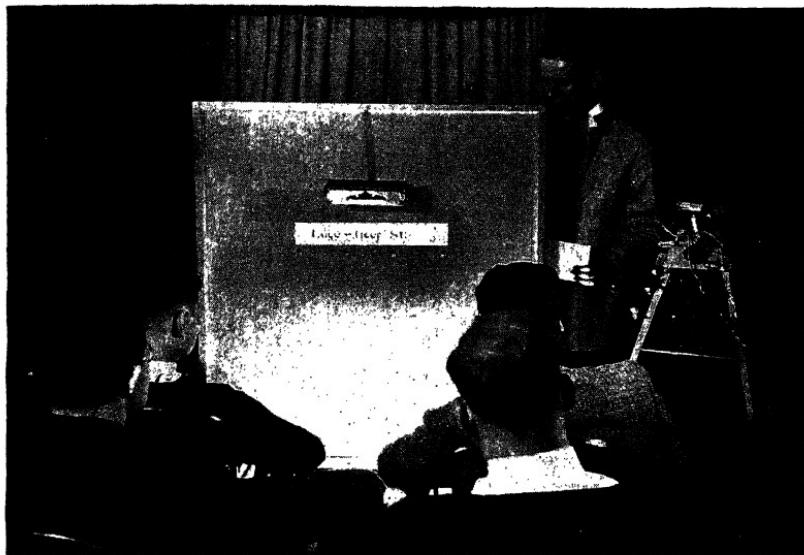
Measuring lapses of attention: In the instrument room this kymograph records the seconds during which the subject signaled he heard the faint tone. Signals from the experimenter in the other room, when he interrupted the tone, are also recorded.

accurate at mental addition. Memory for new addresses, also, was 22 per cent more accurate after the cereal lunches at noontime.

Other measurements showed that there were fewer fluctuations of attention, that they felt peppier, and that they actually could hear fainter sounds, when the brain had been left in better condition by the simple strategy of eating lightly and sensibly.

Oculists tell me that they notice a similar dulling of visual acuity when eye examinations are made after a

heavy meal. It is possible, also, that the sense of touch may be dulled after a heavy meal, since it is known that blood is then drawn from the skin to assist in the processes of digestion. The change in acuity of hearing, however, may be due as much to the relatively anemic condition of the



Here a group is having each individual's ability to remember new street addresses measured. In the window of the board, called a tachistoscope, a name and street appear for 10 seconds, followed by a 10-second blank in which the persons try to fix the address in their memory. Some time later they are given only the name and recall, as well as they can, the street on which the person lived.

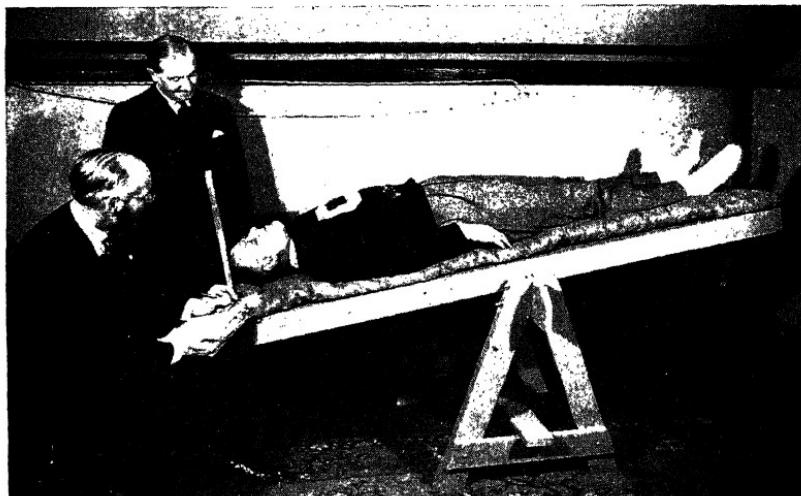
brain following a heavy meal as it is to an alteration in the circulation to the inner ear itself.

This interesting and unexpected phenomenon associated with hemastatics not only throws light on some of the diurnal variations in human performance, but also suggests that the salesman who has a noisy used automobile to demonstrate, could make the noise appear less if he took the prospect out in it after the latter had had his big meal of the day. There may be some such reason why dinner orchestras seem to favor volume more than melody, but I

How to Use Psychology in Business

doubt whether there is an aesthetic justification for their choice of volume.

A critical experimental check was made on the validity of explaining these differences as being due to the altered blood supply of the brain. In the experiments just described, the hemastatic forces were light and heavy meals,



The football coach, Andy Kerr, watches a demonstration of increasing the blood flow to the brain in one of his players on the tilting table.

the heavy meal causing a more marked shift of the blood stream to the stomach areas. In the present study, the hemastatic force was the simple action of gravity in draining the excess blood from the abdominal pool to the head by a slight inversion of the bodies of our subjects.

During a two-week period, excepting Sundays, six young men performed a series of the Krapelin successive and cumulative mental additions under two conditions: first, lying on a mattress which was inclined so that the head was one foot *higher* than the feet; second, lying on the same mattress but with the head at the low end, one foot *lower*

than the feet. In the head-down position, blood was drained, by gravity, from the splanchnic regions to the head regions. External evidence of this altered distribution of the blood was plainly noticeable in an increased coloration in the face, and particularly the external ears, of our subjects.

All six men who served as subjects ate at the same boarding club, two blocks from the laboratory, and no attempt was made to control their food, since the variables of head up and head down were tested each day; this rendered other variables constant. The mental addition was done in the laboratory, starting at 1:15 P.M.

Each afternoon each subject made 100 successive additions in the head-up position, and 100, with a different starting number and different increment, in the head-down position. On half of the days the subjects started in the head-down position; on the alternate days they started in the head-up position. Ten minutes' rest period was allowed between the two series of additions. Equality of difficulty was also assured by using the same constant increments in each position before the experimental fortnight had ended, although no subject added the same numbers in the two positions on the same day.

In the case of the head-down position, where gravity increased the blood supply of the brain regions, producing cerebral hyperemia of a mild degree, the subjects assumed that position for three minutes before the numbers for adding were given them. This was done to assure that the blood supply of the head regions had increased and probably reached stability for that position.

Speed of adding was 7.4 per cent greater with the head down, and accuracy was improved 14.1 per cent in the head-down position. This demonstrates the importance of the amount of blood coursing through the brain at any moment for the speed and accuracy of a mental operation at that moment, confirming under rather drastic conditions the improvement in mental performance previously reported

when a light meal had been eaten as contrasted with a heavy meal. The erect position of human beings apparently gives them especially a moderate but perpetual handicap of cerebral anemia, a handicap which many probably accentuate by unwise eating at times when mental work is to be done.

We cannot refrain from calling attention to some of the implications, which are profound, of this data on body inversion. In the assumption of an upright position through centuries of evolution, *homo sapiens* has undergone many structural and functional changes in consequence of being erect rather than on all fours. He has gained advantages and suffered losses from this position. The data just presented demonstrate that one loss has been a slowing and an inaccuracy in mental functions. If mankind went around on all fours the blood supply of the brain would be better, but the characteristic upright position forces blood to accumulate in the splanchnic pool and produces what might be termed a continuous partial anemia of the brain.

The superior size and structure of the brain in man may be an evolutionary overcompensation, to make up for the slowing up and inaccuracy that the upright position brought in its wake. Sleep itself may be more important for men than for the higher animals because the horizontal position taken in sleep permits an increased blood flow through his brain, repairing at night the loss suffered during the hours spent in erect position.

It is interesting to conjecture whether the further evolution of human beings will be first into a stooped posture and then later into the position of a quadruped walking on all fours, or whether through a survival of the fittest we shall become a race which eats lightly but frequently, or whether the survival will come to the narrow-waisted with a small splanchnic reservoir for shunting blood away from their brain. At all events, the erect position and heavy meals both serve to impair the working of man's brain.

It would seem, then, that to tell the person who wishes to better his mind to "go eat a whale" would be to give ill-founded advice—unless he should eat the whale only a small portion at a time. Brain anemia will get him if he eats too much of practically anything at one sitting, although some foods, such as fats, prolong the anemia more than do others.

I have run across several interesting applications of sensible efforts to avoid the penalty of brain anemia imposed by unwise eating. One large firm, which has its own company cafeteria where foods are most reasonably priced, increased the price of the heavy foods and of large portions, to discourage noontime overeating. Other firms have shortened the noon-hour period, so that the office employees will not have time to eat themselves into drowsiness. Others have had the cafeteria dieticians plan the menus so that there is less chance to load up on foods which will keep the stomach busy all the afternoon at the expense of the brain and the company—whether the company is a firm or a boy friend.

Insane eating habits must be widespread when large firms have to take such steps to do what every individual should do for himself because of his own self-interest. Some have discovered the wisdom of this for themselves long since, and have made it almost a lifelong practice to eat lightly in preparation for mental work.

One of the most popular orators of all time was Henry Ward Beecher. Chauncey M. Depew said of him that when giving an address "Mr. Beecher always arrived late, and everybody thought it was to get the applause as he came in, but he explained to me that it was due to his method of preparation. He said his mind would not work freely until three hours after he had eaten. Many speakers have told me the same thing."

I am afraid, however, that many office workers may need reclining chairs, such as the German restaurant installed, the first hour of the afternoon. And that quite a number of

society buds should request Roman dining divans for listless lounging in the Colony. Both should realize that light eating is best for heavy headwork. Neither brain nor skin is in the pink of condition after a large meal.

I suspect one important reason for this noontime over-eating to be that so many people hurry away from home mornings after a breakfast which is pitifully inadequate. No wonder that so many are famished and eat ravenously at noon. It would be better to take some of the heartiness away from the noon meal and add it to the skimpy breakfast. There is a time for heavy eating and a time for light eating, but many breakfasts come too near the vanishing point to be called even light.

Fill up as generously as you please at the evening meal, but at noon eat lightly and sensibly—and treat yourself better in the morning!

CHAPTER 18

THE MOST EFFECTIVE METHODS OF USING HUMAN STRENGTH

The study of the worker as a mechanical machine, with his vibration points and optimum cutting speed, is the next step to be intensively cultivated in numerous plants. Otherwise this prime factor remains as a limiting influence upon the performance rating of the newly developed automatic machine. But it should be indelibly impressed that the operators are machines *plus*. They are machines, it is true, but they are also men with points of stress and strain, of strain more delicate and more elusive than ever confronted the designer of a bigger and better automatic screw machine. The whole man, as well as the muscles of the man, must be continually kept in view.

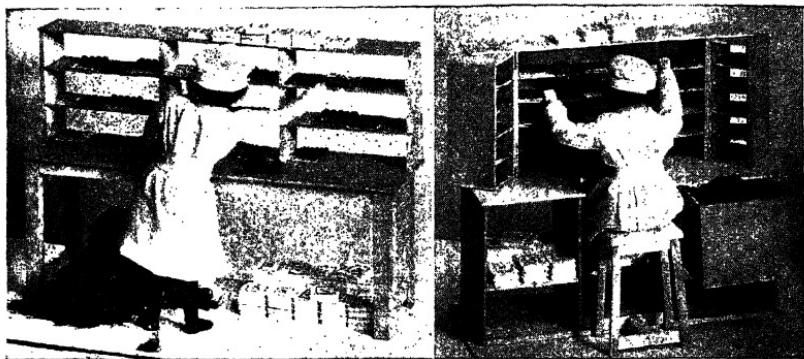
For a few pages we shall look into human muscles as levers and machines, and at the end of the chapter observe some applications of the principles of this matter in industry.

Practically everyone has 10 to 20 per cent more strength than he has been able to use. When one understands how to use his muscles to the best advantage as physical levers, then he can move the weight which cannot be moved by brute strength along. And then smaller weights can be lifted with less fatigue.

A few years ago a woman made a small fortune by capitalizing these physical principles of exerting strength. She called herself the Georgia Magnet and wagered that strong men could not lift her. Almost invariably she won her bet, and for two reasons. For one reason, her statement that she could not be lifted gave what psychologists call a negative suggestion to the strong men who tried to raise her

weight. They were defeated partly by her challenges which weakened their confidence. Confidence increases the effective direction of strength, and the effective use of this strength also increases confidence.

The other reason why this tiny woman defeated strong men was that she knew how their strength could be greatly weakened by simple mechanical methods. The outstretched arm is almost powerless. The Georgia Magnet knew this and



Old arrangement

New arrangement

The work of packing candies into attractive boxes is such light work that fatigue seems a minor consideration. Yet fatigue was reduced and output increased when the packers' benches were rearranged as shown on the right. With the new bench layout the worker can either sit or stand, reaching and back twisting are eliminated, and less floor space is required. There are very few assembly tasks but could be bettered by rearranging the benches to lessen fatigue. In this instance mental fatigue was also saved by having the trays of supplies arranged so the packers did not have to decide how to arrange the candies in the box to be artistic. Output increased 23 per cent on the average. (*Photographs loaned by the National Institute of Industrial Psychology.*)

always kept those who laid bets that they could lift her at such a distance that their arms must be outstretched. So doing, she figuratively trimmed the locks of the Samsons and actually trimmed their purses.

Take, for example, the simple exhibition of lifting a heavy weight above the head with one hand. The weight that can be raised can be almost doubled without extra effort if one knows the physics of his arm. Suppose that when your arm is hanging at the side twenty-six pounds is the maximum that can be raised by bending the arm at the elbow. As soon

as the forearm is raised so that it is at right angles with the upper arm, the strength of the arm will seem to be greatly increased and the twenty-six pounds can be handled much more easily because the arm in this position has capacity to handle thirty-one pounds.



At the start of a pull, the average arm can move only 26 pounds. It takes two hands to start what one arm can lift in a more powerful position.

When the elbow is at right angles, the same arm can then lift 31 pounds.

And in this position the arm can comfortably support 40 pounds, since bone and muscle leverage is greatest.

Arm strength varies with the angle at the elbow.

When the hand carrying the weight is further raised so that it is almost on a level with the shoulder, the same muscles have added advantage to handle more than forty pounds! There is an increase in strength from a twenty-six-pound pull to more than a forty-pound pull, simply by knowing how the arm muscles and bones work as mechanical levers and forces. So if a forty-pound weight is to be raised above your head by one arm, use both hands to manipulate the weight until one hand carrying the brunt of the load is at shoulder height and as close to the shoulder as possible.

In weight lifting there is another physical advantage which can be gained and which we shall discover shortly.

When a heavy load, such as a heavily laden market basket or a tool kit, is to be carried on the arm for some time, strength can be increased and fatigue lessened by taking advantage of some other features of the muscle and bone levers of the arm. The muscles are attached to the bones they move in such a way that their power arm is very short. In consequence the muscles must exert great power to overcome a relatively slight resistance at the end of the moving bone. Conversely, this means that a short muscle movement will produce a wide movement at the end of the bones. The body is thus discovered to be put together as a machine best adapted to make quick movements against relatively small loads. So when heavy loads are to be maneuvered, knowledge about how best to use muscles is valuable.

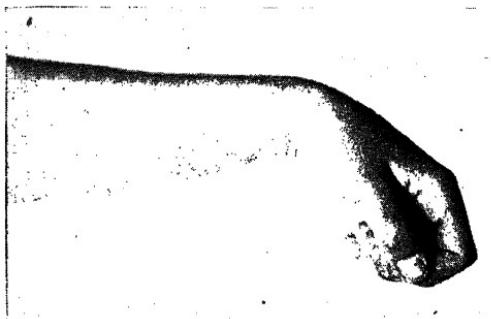
The heavy basket can be carried most easily if it is placed as near the joint as possible, as in the crotch of the elbow. The weight can be carried in the hand with the arm hanging at the side; but much more effort is then required and the hand is quickly fatigued and may relax its grasp for another interesting reason.

Since almost every arm and leg muscle passes over a joint before it fastens to the bone it moves, bending the joint over which it passes alters greatly its effective use. How this works in the case of the fingers grasping the basket handle was first demonstrated to me in a rather dramatic way several years ago in a Midwestern mental hospital. A patient with suicidal tendencies managed in some unknown way to sneak a sharp butcher knife from the diet kitchen. Getting the knife away from him without letting anyone be injured was a problem. Two of the nurses managed to grab the knife hand from behind while the patient was momentarily off his guard. So far, so good, but it looked as if the nurses would have to hold his hand for many hours before he released his grip on the knife with which he had planned to snuff out his life.

Another nurse knew that if she forcibly rubbed her knuckles over the cords on the back of the patient's hand he would release his hold on the knife, due largely to the pain in the back of his hand; but this could not be done since



When the wrist is bent backward, finger strength is at its maximum for gripping objects, since the tendons which move the fingers are relaxed.



When the wrist is bent downward, the tendons are stretched so that the fingers cannot close tightly. Compare the loose grip possible in this position with the top photograph.

Finger strength is helped or hindered by the position of the wrist.

a strictly enforced hospital rule prohibited inflicting pain. If the nurse had done this, the hospital would have had her arrested for assault and battery.

What was there to do?

Finally an ex-policeman who was a patient in the same ward came forward with the idea that solved the trouble.

When the hand is bent as far as possible in the direction of the palm by flexing at the wrist, the muscles which control the finger grasp are stretched across the joint, he explained, and it is impossible to clasp the fingers tightly when the hand is flexed at the wrist. So the patient's hand was bent downward. Although he was still keeping his fingers as tight as he could around the knife handle, he could no longer keep them tight enough to prevent the knife from being easily slipped out of his grasp.

When the wrist is bent backward the opposite finger effect takes place and objects can be grasped tighter than before. So the grasp on the basket handle, or on the weights to be lifted above the head, will be increased effectively if the wrist is bent backwards as far as possible. This is called extension of the wrist. Simply changing the wrist from extension to flexion causes the fingers spontaneously to grasp at extension and release at flexion.

The muscle which moves the tip joint of the fingers passes over the other joints of the finger. This muscle is the *flexor digitorum profundus*, and is the only muscle having a bending action on the tip joint of the finger. Since this flexor passes over the other joints at wrist, knuckle, and middle joint of the finger, it is practically impossible to move just the tip joint; invariably the middle joint of the finger will move with the tip joint, unless the middle joint is held by the other hand.

The thumb tip is flexed by the *flexor pollicis longus* muscle. The thumb tip can be flexed after slight practice without the other thumb joints' moving. The thumb can seldom be turned backward any distance without the little finger's moving slightly.

These facts are important in piano playing, where often a blow of several pounds force has to be exerted on the keyboard to produce a loud-tone intensity. Flexing or extending the wrist modifies the force that the fingers can exert on the keyboard.

"Muscle-bound" people actually exist, and their condition is largely due to either joint characteristics over which muscles pass on the way to the section they move, or to the antagonistic muscle being a little too short and restricting the joint movement. In some rare cases a muscle-bound condition is caused by a muscle's being absent from the time of birth.

Practically everyone is muscle bound at the hip and knee joints, due to the *rectus femoris* muscle which is active in moving the leg forward. This muscle is short and is responsible for the difficulty of putting the heel back of the head, and of kicking above one's head. Exercise and persistent practice, however, have overcome this in many ballet dancers.

Owing to the muscles' passing over one or more joints, there is a great variety of ways in which strength can be increased or decreased. Dr. Wilhemine G. Wright, of Boston, has discovered that the arm can lift ten pounds more at arm's length with the elbow kept stiff when the hand is held palm upward, than when the palm is turned down.

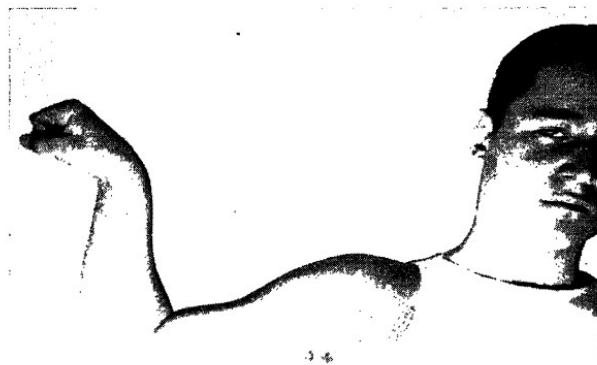
In such a simple act as getting up from a chair, fatigue can be lessened by taking advantage of muscle and bone mechanics. If the feet are drawn in close to the chair the strong thigh muscles will be used, saving the relatively weak arm muscles. To get out of a chair most easily and with much grace, draw the feet as far under the body as possible, bend the trunk slightly forward, and the body rises almost automatically and without appreciable effort.

There are many other times when the powerful thigh muscles can be used in place of the arm muscles. In lifting a wheelbarrow, a heavy suitcase, or a laundry basket, instead of bending the back and keeping the legs straight, it is the knees that should be bent in stooping—or squatting—to reach the load. It is lifted easily by straightening the legs, meanwhile keeping the wrist bent backward slightly to make the grasp of the fingers easier and more certain. The feet should be placed as close as possible to the object

to be lifted. The Georgia Magnet had her challengers stand with their feet as far from her as possible.



Now you see the powerful biceps muscle



A simple twist of the wrist and now you don't see it! It was made to disappear simply by turning the hand so the palm is downward. The biceps is brought into action only when the palm is up. Remember that the next time you have heavy lifting to do—keep the palm up so the powerful biceps will be used.

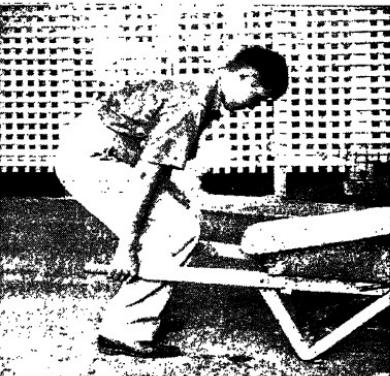
How to make your biceps muscle disappear.

Sometimes there is an advantage in bending at the waist rather than at the knees, especially where only light loads

are concerned. This is because in bending at the waist gravity rather than muscles do the work. The muscles merely relax their tension of keeping the body erect, and gravity pulls the body. In exhaling breath during sleep, exactly the same principle is involved, if one is sleeping on his back. This position enables the muscles of the diaphragm



The wrong way—The wrong muscles are being used. The back has to lift the load.



The right way—Bending at the knees, the powerful muscles of the upper leg are used to lift the load.

The legs of the wheelbarrow are at least eight inches too short for this person. A great deal of fatigue would be caused unnecessarily if he worked a full shift without an extension being put on the legs. The standard wheelbarrow has legs too short for the standard worker.

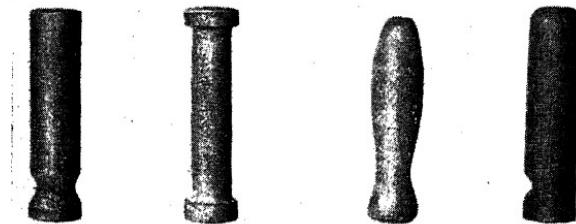
and the thorax to relax during the ten or twelve exhalations per minute.

Under the best of conditions the toes are clumsier than the fingers, except for the fact that the toes are superior to the fingers in having a greater amplitude of movement under favorable conditions. But even this is apparently being lost and the foot is becoming more clumsy through disuse and actual deformity. Among peoples who do not wear shoes the toes are still often used for grasping objects and for aid in climbing trees.

In walking, the toes normally and automatically are lifted when the free leg is swung forward by the contraction

of the three extensor muscles. Apparently the main purpose of this is to keep the toes from hitting the ground. If these extensor muscles are paralyzed for any reason, the walker lifts his leg abnormally high at the knee, producing a "spring-halt" gait.

So-called civilized shoes hold the toes up from the ground by a stiff sole which quickly becomes permanently curved upward at the toe, thus shortening the extensors through



The best crank handle is on the left, followed in order by the second best, and the poorest is seen at the extreme right. Most crank handles in use are the second worst shown. (*Data from O. Klemm and F. Sander.*)

loss of their function. This produces the well-known "claw position" of the toes, which anatomists maintain amounts to a genuine deformity.

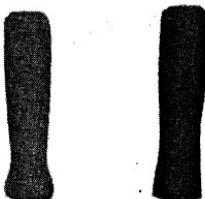
Shoe trees used to thwart the tendency of the soles to turn upward help to overcome this. Going barefoot or following prescribed exercises will also help, and so will shoes with generous toes which permit the action by the extensors. High heels bend the foot joints and further distort the function of the toe muscles, after the same fashion that bending the wrist modifies the finger action.

Tote boxes, which carry materials to machine tenders, should be placed on a rack at such a height that stooping is not necessary. Adjustable height is a desirable feature of these racks so that they can be accommodated to

differences in worker height, which may average as much as half a foot. Tool racks should be given similar consideration.

Stretching is as fatiguing as stooping, but stretching is the better exercise, even though it does cause more accidents. Overhead levers for shifting belts, switch and fuse boxes, and machine adjustments should be designed for a level which the average man can reach without stretching.

There is one exception to the general principle that stooping should be avoided, and this occurs in certain



The most effective screw-driver handle is on the left, the worst on the right. The bigger the handle within reasonable limits, the better so far as work and fatigue are concerned. (*Data from B. Rubarth.*)

grinding operations. The operator's strength for bearing down on the abrasive surface is increased and his fatigue lessened if the wheels are rather low hung so that the castings can be held almost at arm's length and weight applied by leaning with the trunk, rather than merely bearing down with the forearm. This is only a partial exception, since it does not apply to fine work or light work.

Accuracy is increased, however, and fatigue decreased if a counterbalance is provided at the grinder to facilitate manipulating heavy parts. The time and strength wasted in turning the part around on a stool top is avoided by having a handy counterweight. This same principle can be applied to handling heavy parts on almost any machine, as well as to some "portable" drills which weigh in the neighborhood of thirty pounds.

How to Use Psychology in Business



The old way. Polishing and glossing hairbrush handles require two grades of buffs. The seat midway between the wheels made the worker twist first to the right, then to the left. The stationary footrest was not right for many workers. Dust was sprayed on to the operator, and breathed by her. The bench top was too small.



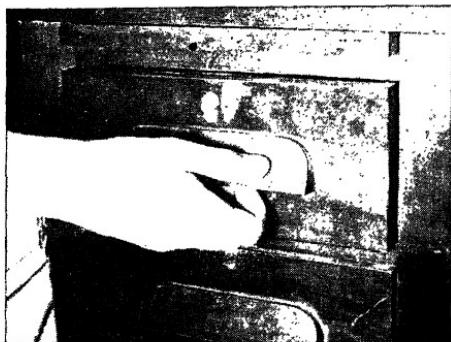
The new way. A saddle-shaped seat and the new footrest adjustable for the build of each worker. The seat is directly in front of the buffering wheel—no twisting. Buffering is done standing at another wheel. Exhaust hoods collect the dust. There is adequate tray space in the new bench. Output increased 12 per cent. (Photographs taken in British Xylonite Co. plant, used by courtesy of the National Institute of Industrial Psychology.)

In the purely manual operation of using a wheelbarrow, this counterbalance principle is also being applied. About seventy bricks is the usual load for a wheelbarrow. It should be placed on the barrow so that the downward pressure on the handles is only fifteen pounds when the worker is holding the handles at arm's length, as in raising them; this demands that the correct wheelbarrow design allow for some of the load to reach in front of the wheel, as well as allowing for some adjustment in positioning the load for workers of different height. Also, since inertial forces are involved in starting and stopping the barrow, long uninterrupted runs with the loaded barrow are more economical of human strength than short runs.

In another manual labor task, shoveling, other principles of increasing strength and conserving fatigue emerge. The stoker of the home furnace will save his comparatively weak shoulder and arm muscles if he squats slightly and rests the handle of the shovel against his knee and thrusts the implement into the coal bin with a push primarily from the knee rather than from the shoulder. The main work is thus thrown upon large, powerful, and relatively fatigue resistant muscles in the legs.

Because the muscles of the body are not arranged in neat parallel lines, there are certain working positions of a limb in which there is freer and stronger action than in other positions. The outstretched arm, we have seen, can carry on the average ten pounds more with the palm up than with it down; this reminds us of the difficulty in steering an automobile when the toe-in and pitch of the front wheels are not correctly adjusted. In the dexterous assembly of fairly large parts, work will be facilitated by having the bench level three or four inches below the level of the elbow; in this position the fingers close more readily upon objects. If it is the assembly of small parts, the table level should be somewhat higher, since in the higher position the muscle arrangement of the hand facilitates grasping smaller objects with less effort.

The height from the floor of an object being hammered, according to the recent work of Dr. H. Lange, German



The handles on most desk drawers look fine, but are built so the arm has to be twisted into an awkward position, with the palm up, before the handle can be grasped.



The desks in the Colgate laboratory have knobs for drawer pulls. The neck of these is long enough for the fingers to be easily slipped behind the head of the knob to pull the drawer without twisting the arm into an especially fatiguing position. In single pedestal desks, also, the drawers are on the left, to follow the principle of throwing all possible work on to the hand that is free.

psychotechnician, should be 54 per cent of the height of the man using the hammer, for most effective and least fati-

guing results. Best results are obtained with the small hammer, if its handle is about 11.5 inches long.

In adjusting and tightening machine tools, the arc in which the pull is either straight toward or straight away from the body is the one of greatest strength. If the final tightening quarter-turn of the wrench has to be made when



It is most fatiguing to carry the load on the hip, probably since the posture is shifted sideways.

The best load for carrying is 40 per cent of one's weight—but fatigue comes from how it is carried as well as how much is carried.

This way of carrying is not so hard on the posture, but it is fatiguing.

The best way to carry the load is on a yoke, or on the head. The shoulder is third best.

the tip of the handle is nearest to or farthest from the operator, the tool is likely not to be tightened as securely as might be desired. Of course, the operator might loosen the wrench and take another bite, but it is not likely that he will; hence, a ratchet machine wrench is most desirable when tight cutting or shaping tools are wanted.

In carrying heavy loads, which is going somewhat out of fashion in America, maximum results with least fatigue are obtained when the load is 40 to 50 per cent of the body weight of the laborer. It is most effective to use a yoke, with the load balance on each side. It is least effective to carry the load partly on the hip.

CHAPTER 19

IMPROVING THE CONTROL OF MUSCLES

Now let us turn to coaching in business, that is, to training the workers to reach the most skilled use of their muscles within the limits imposed by their general ability. As in most of the other chapters, we shall take up first some underlying scientific facts, so as to have understanding, and not merely cookbook rules, when we have finished.

Don't pity the blind man. He should make you feel sorry for yourself.

Students are from Missouri, so I had to show a group of them that I could justify that statement. For some reason I have the local reputation of being an "efficiency bug." So when snow became deep and I plowed through the drifts to the laboratory in knee-high leather boots, I was the object of good-natured jibes.

"What!" exclaimed Hoitsma. "You aren't wasting time every morning by lacing all that cowhide!"

"No, he isn't," put in Martino. "He sleeps with 'em on!"

I had to defend myself..

Hoitsma unlaced his low shoes, I unlaced mine. Then I was blindfolded. At the word "Go" both of us started lacing our footgear. I won, and psychology was vindicated.

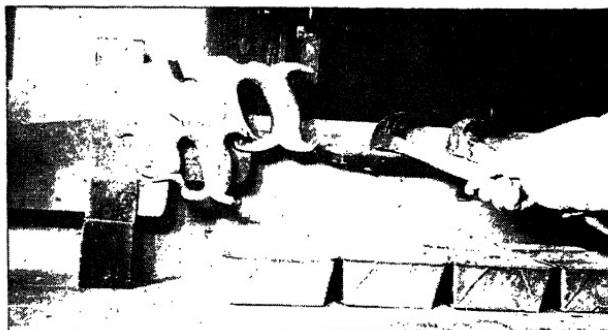
My high boots had hooks. The strings of one shoe were manipulated by one hand so that with a single motion two hooks were strung. Both hands worked together, one on the left shoe, one on the right. Hoitsma was handicapped by his shoes' having eyelets.

Not only did psychology beat Hoitsma, but in the excitement of depending on his eyes he overlooked one eyelet and got the string through another eyelet twice.

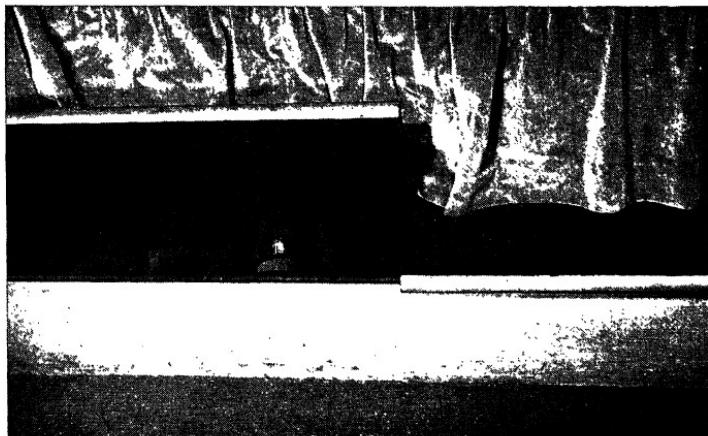
"Where did you learn that?" was the chorus.

"From a blind man," I answered.

The hands had been freed from their bondage to the eyes. In fact, they have their own eyes, thousands of them,



Tools in the laboratory shop are arranged on bench racks so they are in the correct position for use the instant they are picked up. This is the Gilbreth principle of pre-positioning to save excess motions.



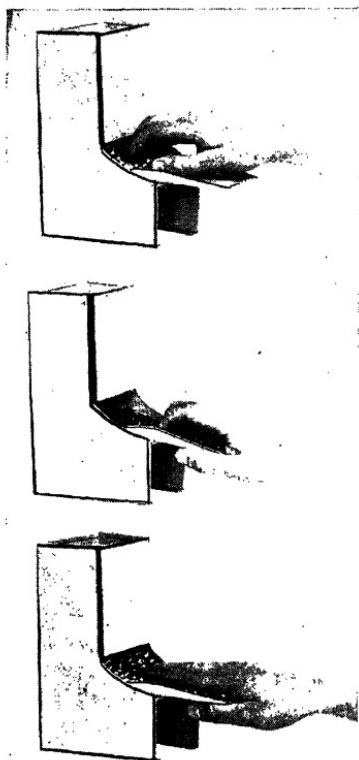
Starting the day right—with prepositioning of shoes in this built-in space at the edge of the bed. Hose are under the lid at the right. Steps and temper are saved in the morning dressing.

which are much better to guide the muscles than the eyes on each side of our noses.

You recall the picture of the five kittens? Perhaps you have it in your house. One kitten is smelling a bowl of roses,

illustrating the sense of smell. Another listens to a bee, illustrating hearing. A third is drinking milk—taste. There were just five kittens because it was thought that there

were that many senses, the other two being touch and sight.



A supply of small parts is easily collected from this special hopper by the use of the small tray. Three phases of the single motion which is needed to fill the tray are shown, from top to bottom, in these pictures.
(Courtesy of General Electric Co.)

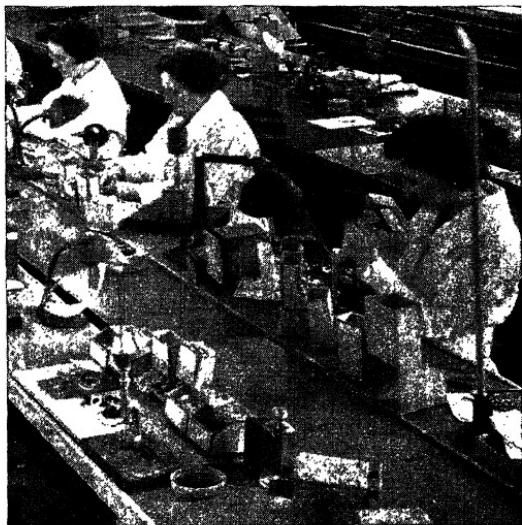
sometimes with painful consequences.

It was a disease which first brought the attention of scientists to these three senses which guide muscles. A young woman with a small baby in her arms went to a London hospital on account of some ailment. She carefully

We know now that there are nearly fifteen senses, probably more. In lacing my shoes blindfolded, I depended upon three senses unknown until a few years ago. They are the senses which help the blind to do such wonderful things. They are the muscular, articular, and tendonous senses. Each muscle fiber has a tiny sensitive nerve which acts as its eye. Left alone, the muscles can often-times be guided better by their own eyes than by our judgments.

We can run up a dark stairway without any trouble—until we begin to use our judgment. As soon as we try to exercise reason instead of letting the muscle use its own good sense, our feet stumble and we furtively try to take another step after we have reached the top of the stairs,

watched the bundle of life in her arms. But when the physician spoke to her and she had to take her attention away from the child, her arms relaxed and the baby tumbled to the floor. Something had happened to her muscle senses so she could not tell where her arms were without looking at them.



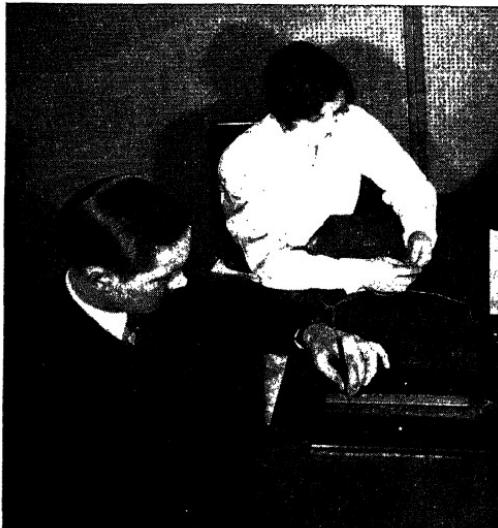
Special hoppers which partially preposition the parts being assembled for miniature electrical instruments. The effective work area for both hands is used. The workers wear white linen smocks to prevent dust and lint from getting on the delicate instruments they are assembling. (*Courtesy of General Electric Co.*)

The shuffling gait in some forms of paralysis is caused by the eyes of the leg muscles becoming blinded so that they can no longer guide the movements. The feet then are dragged along, but not because the muscles have lost strength.

A rough-and-ready test to find out whether the eyes of the muscles are up to par is to hold the arms above the head, with the eyes closed. If this is done in front of a mirror, both arms should be seen to be at the same height, when the eyes are opened to look into the mirror. If one arm is lower than the other, as sometimes happens, the eyes of the

muscles in that arm are not working up to par. This can be tested with the arms in different positions.

For operating complicated machinery the muscle eyes should be perfect, because it is not possible to watch everything with the sense of sight. In learning to operate machines, also, the eyes should be used as little as possible.



Steady muscular control in tracing between the two electrically charged sides of this foot-long groove is increased if one takes a long breath at the start and holds it until the task is finished. Remember this secret, which is used by expert marksmen and toolmakers—rest the hands on something, hold the breath, and let the muscle eyes do their work.

When the muscles learn without the aid of the eyes they not only do their work better, but they learn in less time—an all-around saving.

The active games of childhood are good training for dependence upon the muscles alone. Most children do too many things at once for ordinary human eyes to keep account of everything. Sports and gymnasium training are excellent for the same reasons.

The blind do not have any better ears or more sensitive muscles than seeing people have. Circumstances, however, have forced them to make more use of their more fundamental senses. Their many accomplishments should make



This solderer's arm is twisted uncomfortably and is in such a position that the powerful biceps muscles are not used. What industry needs for this and many similar operations is soldering irons with a pistol grip.

the rest of us more sensitive over the poor way most of us utilize the natural resources within our minds.

"My husband may make students think he knows physics," a professor's tattletale wife informed a group in a superior way, "but he can't even fix the cistern pump!"

What he read in a book he could reel off by the hour. So everyone thought he knew physics. That is, everyone except his wife and a firm which had been impressed by his lectures and engaged him as a consultant to work on the physics of a manufacturing problem they were up against. He worked for them—for a short time. The books would not help him on this job, and he could not use his hands to save his head, or to save his new well-paying job.

I told this incident to a small group of industrial executives in Syracuse recently. One of them—a graduate in engineering from a well-known Eastern university—spoke up with great fervor in his voice.

"Nobody knows that better than I do," he said. "I graduated with highest honors from the scientific school. I had my pick of the jobs at commencement time. Six weeks was the longest I held a job, the first three years after I graduated. I knew engineering cold from the books, but I couldn't *do* a thing."

He knew everything in the books, but he could not use his hands to save his head. It took him fully ten years to find out from hard and cruel experience that after one is out of college it is what the hands have stored up in them that counts.

Just yesterday I received a letter from an executive who is with a large oil company. It was in response to an inquiry I had sent him to find which college he had attended. Here is his reply:

DEAR DOCTOR LAIRD:

At least I have a home town, San Antonio, although I haven't lived there since 1917.

As to education: I have only had three years and three months of formal education. Three of these years were spent in the San Antonio High School. The three months were spent in the University of Texas. That, I believe, ranks me about a total illiterate.

This is my reply, which went in the return mail:

Dear Mr. _____:

Be yourself! You have probably forgotten more valuable practical knowledge than the average college graduate is willing to absorb the first dozen years after he graduates—it usually takes them that long to come down to earth and find that their hands are as important in the work of the world as their heads.

Each of us has two eyes with which to absorb book knowledge.

In each arm there are hundreds of thousands of eyes which are far more effective in gaining a knowledge of things that will work, of how to do things. The professor of physics had not discovered this. Neither had the executive I met in Syracuse—until after ten years of disappointing experience. The executive with the oil company had



Muscle control of would-be solderers is tested with this unique soldering iron which has a small paint brush for its tip. The applicant draws prescribed lines with this awkward equipment. (*Courtesy of National Institute of Industrial Psychology.*)

found it out, and his meteoric rise shows how the hands can save the head.

Helen Keller was a Southern girl who was made blind, deaf, and dumb by a childhood disease. She had her hands with which to master the world. Using the thousands of eyes in each arm, she became more accomplished and more a master of her world than most of the graduates of Eastern girls' colleges. Laura Bridgman, another blind deaf-mute, was the first to be successfully educated so as to take a useful place in the world.

Schools are beginning to acknowledge that the muscle senses are a basic channel through which to educate. First came laboratories; then manual training; then all sorts of industrial activities. Then in progressive schools the physics laboratory was changed from a place where things were done according to routine, after foolproof directions in a red-cloth-covered book, to a place where things were *made*. Here is a clipping from the *New York Times* about such a class:

Every boy of the twenty-five hundred who attended the public school at Broome and Willett Streets was fired with admiration and interest when two diminutive Edisons from their ranks set up a telegraphic system, operated by wet batteries of their own construction and stretching four hundred feet through the school building from one room to another. For weeks the two boys had been reading the life of Morse and studying the scientific principle behind this use of electricity.

That such a common-sense method of letting the boys learn physics through their hands should constitute news is a reflection of the widespread and justified belief that the hands can save the head in mastering one's world.

There is, for instance, the boyhood record of G. Stanley Hall. Dr. Hall studied experimental psychology under Wilhelm Wundt, who founded the first psychological laboratory in the world at the University of Leipzig, scarcely half a century ago. When Hall returned to the United States after his study abroad, he was soon called to establish the first psychological laboratory in America, in Johns Hopkins University. And when a wealthy New Englander wanted to start a college where students might learn by doing, he called Hall to organize and become president of Clark University.

The psychological students trained by Hall are now the leaders in psychology. Why? Hall trained them by having their hands help their heads. They did things. They started where the books left off.

Hall was a farm boy. It was there that he received his real education, in using the senses in his muscles, tendons, and joints. He said of his boyhood:

. . . trees were chopped down and cut by two men working a cross-cut saw, which was always getting stuck fast in a pinch which took the set out of it unless the whole trunk was pried up by skids. . . . The logs were sometimes cut into cross sections fifteen inches long, which was the legal length for shingles. These were taken home in a pung, split with beetle and wedge, and then with a frow, and finished off with a draw-shave on a shaving horse, itself homemade. . . . Repairs were made during season, and a new cat-hole beside the door with a lateral working drop-lid, which the cat operated with ease, was made one winter.

. . . box and figure four traps for rats and squirrels; windmills; weather vanes in the form of fish, roosters or even ships; an actual saw-mill that went in the brook, and cut planks with marino and black and white Carter potatoes for logs; and many whittled tools, toys and ornamented forms and puppets.

. . . *How much all this has saved me since, in the laboratory, in daily life and even in the study it would be hard to estimate.*

A large factory where electric meters are made has to exercise unusual care in selecting workers for some of its assembling jobs, and now has a psychologist giving tests as to how well applicants for these jobs can control their muscles. They have to assemble hairlike metal parts with tweezers; if one of the minute parts is grasped roughly or unevenly, it would be ruined through an almost imperceptible bend. Highly delicate muscular control is absolutely essential for this job. The blacksmith's type of control would utterly disqualify him for this work.

In dancing, home repair jobs, and even walking gracefully down the street, considerable muscular control is essential. During one period in life everyone is usually bunglesome in this control. This is in early adolescence, or what some call "the awkward age." From about the age of thirteen to fifteen, this awkward period is at its height. It is more marked in boys than in girls. Just what causes this is not yet definitely known, but scientists in general attribute it to an acceleration in physical growth which takes place at that same time, and to some extent to the activities of the ductless glands, which have a great deal to do with bodily grace and muscular control.

Anyone can acquire better muscular control, except a few persons who have had important muscle-controlling nerve centers destroyed or affected by disease, injury, or diet. But acquiring this control is as difficult a matter as it is serious, for a very interesting reason. The coordination and control of muscles usually take place unconsciously, through the aid of those hundreds of thousands of highly sensitive sense organs that are buried in almost every tiny strip of muscle fiber. These muscle sense organs—nature's tiny microphones—telegraph along nerve pathways until their impulses report conditions at their center in the base of the brain. Often it is not until disease has destroyed the guiding control of these muscle eyes that many people realize that they have them, or realize the great aid that they give in everyday muscular activity.

Have you ever asked a skilled athlete how he does it? Or the expert workman? He has great difficulty in telling because, like the rest of us, he is not consciously aware of the thousands of messages flashed from the muscle eyes to the brain centers, where they are integrated almost automatically.

"Watch me, and I'll show you how," he may say; but he cannot describe the definite sensations he uses to guide himself, because they are unconscious. His superb performance seems easy to him, since the athlete's muscles are almost automatically controlled. The best way to learn how he does it is, as he says, to watch him and then try to do it exactly as he does.

The athletic coach puts the men he is developing into different positions and scrimmages so that they will gain this unconscious sensing. Sports writers, who often have a remarkably keen knowledge of the fine points of various games, are utterly unqualified to play or coach because their muscles do not have these controlling guides developed to the right pitch.

At a navy boxing match, I witnessed a rather dramatic turn of events which impressed forcibly the fact that

criticism is much easier than performance. A chief gunner's mate who had had more than twenty years of sea service was refereeing a series of boxing matches on the deck of a man-of-war. A large number of civilian guests had ringside seats. The first two teams were evenly matched, but the third bout was between an unfairly matched pair. One of the



The wide, soft pad on which this girl rests her elbows saves her fatigue and saves the company precious platinum which she is welding to contact points. The arm rest steadies her arms for the close work she must do and also saves fatigue from holding the arms extended. (*Courtesy of Western Electric Co.*)

civilian spectators immediately sided in with the more skilled boxer and quickly became noisy in his condemnation of the inferior boxer.

Suddenly the gunner's mate halted the bout and walked to the side of the ring closest to the noisy spectator. "That lad has been in the Navy four months," he shouted. "Last week he boxed another gob whom he knocked out. This week he asked to be matched with a sailor who would give him a harder fight, so that he could learn more. Either one of them could whip you singlehanded. If you don't believe it, I'll let you try it."

When the bout was finished, the poorer boxer received the more applause, and the noisy spectator had mysteriously disappeared.

Many people upon their first sight of an internationally known athlete are disappointed to find that he is not a large fellow, but usually of about average stature and muscular build. It is the control of muscle and not heroic strength or



There is an effective working area for the desk or bench top. The white lines show the area which can be reached by each hand without moving the shoulder. Where the white lines overlap both hands can be used at work with least strain. The pencil rack is outside of the effective working area, causing stretching whenever a pencil is taken or returned. Muscle control is best inside the white lines.

brute force that gives these wonderful performers their skill. Paderewski and Kreisler have potentialities for great athletic skill in the control of muscle which they use in producing fine shadings in musical expression, instead of on the cinders. The goal in all this development should be accurate and graceful control, not primarily strength.

Sand-lot baseball teams, made up of neighborhood children, have developed more professional baseball players than college teams have. This is because incessant practice in the use of muscles is absolutely indispensable for developing the unconscious control of muscles. Many star per-

formers, of course, have been born unusually well equipped for control, but by dint of ceaseless practice they have improved upon this inborn advantage. And many who were born with equal possibilities of control have not taken the practice or exercises, with the consequence that now they can be readily excelled by the great majority who have made the effort and taken the pains to develop this control. Whether in skating, golf, penmanship, or cabinetmaking, practice and then more intelligent practice is essential.



Here the calculator and pencil rack are inside the effective working area, where things should be that are being used. The space outside this area can be used for ornaments or rarely used tools. Tote boxes should be arranged just inside the white semicircles.

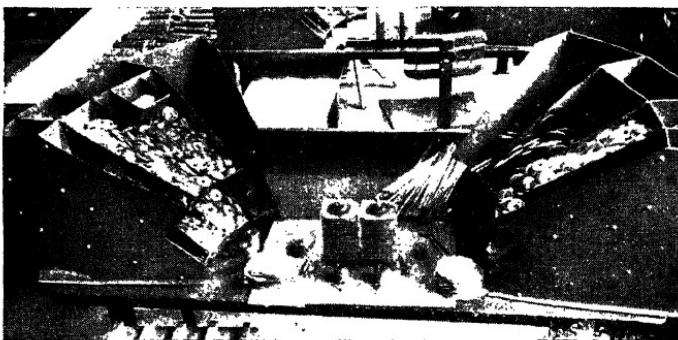
The best territory for working hands.

The benefits of consistent and intelligent practice do not always appear at once. A disappointing feature of the psychology of practice is that improvement is not steady with each additional hour of practice. It progresses by jerks. Often one may practice for a month without showing any gain in control, while the next half-hour of practice may send him spurting ahead by 25 per cent. It is hazardous to stop, for it may be that the next practice period would show a phenomenal gain!

On account of this, it is unwise for the individual to become satisfied with his performance. Twenty-five years ago,

for example, Rose L. Fritz typed eighty-two correct words per minute and earned the world's championship. It was considered a phenomenal record by everyone, including Miss Fritz. But her trainer encouraged her to do better, and Mr. Kimball kept her busy practicing, trying to improve her own record. In consequence, she raised her accomplishment to ninety-five words per minute two years later.

The basic laws of the psychology of gaining skill are discussed in detail, from the practical point of view, in my



Semicircular arrangement of work stations for assembly of rectifier, arranged so the most effective work area is utilized. Note, also, the sloping bottoms in the stock bins which keep the supply of parts at the front where both searching for parts and stretching to pick them up are eliminated. (*Courtesy of General Electric Co.*)

book "Increasing Personal Efficiency." There is no single, specialized exercise that will develop a finely balanced control of all muscles. The exact muscles which will be used have to be exercised in the way they will be used in the game or on the job. Exercising the right arm does not strengthen the left; exercises which bring all the muscles into play are the most to be desired. Gene Tunney recommends vigorous walking, since it involves practically every muscle fiber and sense cell in the body.

It is little short of miraculous how long the muscle eyes and their nerve centers will remember automatically after they have been thoroughly trained. Take the experience of Robert Houdin, the famous French magician after whom

Albert Weiss took the stage name of Houdini. As a young man he had trained himself to juggle so that he could keep four balls in the air at once, using only one hand. After an interval of thirty years, during which he had no practice in juggling balls, he tried it again and was able to keep three balls in the air at once without trouble.

In the late nineties newspaper reporters were amazed when a relatively unknown entrant in the political field, from Canton, Ohio, walked up and down a hotel room, brandishing an old-fashioned razor with which he alternately punctuated the remarks of his interview and shaved himself singlehanded, without a mirror. It was William McKinley who gave this demonstration of muscle control.

CHAPTER 20

WEATHER FOR WORK AND SELLING

I wonder whether you realize how much effect the weather exerts on your daily life and activities.

How much less work do you think you can do on the hot days that are more or less seasonable than you could on more pleasant days? To what extent do you think your ability to concentrate is affected by heat? How much less accurate do you think you are in summer than in winter?

Very little, you probably will say. But science knows better. Scientific tests of workers in diverse lines of endeavor show that on the hot and sultry days of summer your energy, and consequently your physical and mental efficiency, may be reduced by as much as 60 per cent! Moreover, when the thermometer registers ninety degrees or more, you are about twice as likely to make an error in work requiring concentration and accuracy as you are on days of moderate temperature!

These figures, of course, are extreme. But science has learned that variations in the weather cause surprising variations in human energy. Just why our ability to work and concentrate varies with the weather, science has not determined exactly. The decrease in efficiency that comes with disagreeable weather probably is due in part to discomfort. Another tenable explanation, however, is that the lowered efficiency is due to changes in the metabolism, or chemical action, of the body.

It is a law of chemistry that chemical activity is speeded up by heat and retarded by cold. And so it is quite reasonable to assume that varying meteorological conditions affect directly the chemical processes of the body.

In hot weather, for example, the chemical action of our bodies is increased to such an extent that waste products pile up more rapidly than we can absorb oxygen to destroy them. The effect of this accumulation of waste is the same as fatigue; hence, the inertia that prevails in the summertime; the reason why summertime is mistake-time. However, we cannot blame it all on the summer. Intense cold also causes a reduction in physical and mental energy. In this case, the chemical processes of the body probably are so slowed up by lack of heat that the energy produced falls below normal.

All of this means that it behooves you to make especial efforts to guard against errors in your work whenever it is especially hot or especially cold.



Mark Twain is always good to quote, but the march of science does make some of his old jokes out of date. Take his comment, for instance, about people who talk a great deal about the weather without doing much to change it. In the last two or three years many thousands of people have seen it changed, and in the next few years doubtless many times the present number will have taken the weather into their own hands—or at least into their own cellars.

And where the present generation has not been able to make the weather to suit their whims and comforts, they have shown the ingenuity to make themselves less dependent upon the effects of weather than, say, their grandfathers were. Take my grandfather, for instance. Not so many years back, he traveled around the Midwestern states in an open buckboard, buying and selling cattle. Come rain, come snow, come sleet, he was right out in its discomforts, clucking to the horse, slapping its back with the reins, and wiping the snow or sleet out of his own eyes. That is, he had to put up with all that unless he happened to be near a farmhouse where the cooking was famously good. Soon he would more probably be found there in the kitchen, praising the

pies and puddings and taking unduly long to appraise the livestock, until the weather moderated.

But old John's grandchildren—they are almost a bunch of softies. Why, they will not go out in a slight snowfall unless the automobile is not only fully enclosed but also equipped with heater, defroster, and radio. And they would no sooner put up with an old open buckboard in all sorts of weather and seasons than they would put up with a roaring fireplace, where the blazing logs would toast one's shins while the back of his neck was nearly frostbitten.—No siree! today's children insist upon circulated and uniform heat. They insulate their houses; put blowers in the cellar and regulating gadgets on the walls, which work automatically; wear lightweight underwear the year around; drink in wintertime beverages which their parents looked upon as summer drinks; and use the vacuum bottle for iced drinks in summer and hot drinks in winter.

Except for shoveling snow, the seasons and weather mean comparatively little in the life course of the average individual nowadays. Without deliberately planning it himself, he has shown that Mark Twain was wrong and that people are doing something about the weather. Of course, the people who have done most about it until recently, I regret to admit, are not the scientists. Some wise old sales manager, instead, thought he could get people to drink Coca-Cola the year around; and now they do. Some other wise men who had never been nearer a laboratory than to have a life insurance examination, hit upon the idea that an enclosed and weatherproof automobile would have a year-round market.

And, more recently, the furnace man and the plumber hit upon the idea, which now seems obvious, that the heating system could be used to keep the air cool in summer. Then another fellow, with perhaps more technical training, added the useful thought of filtering, washing and purifying the air at the same time. So we got air conditioning, first as a commercial novelty, or as a way of coaxing customers into a

theater or a store by giving them comfort along with the entertainment or the merchandise they bought.



In this the history of the race is repeating itself. Far back in Paleolithic times, our prehuman ancestors were pretty much restricted as to where they lived. They had to stick to the plains which had temperate climates. Clothing, such as it was, helped a little, but it did not help enough. The first step in the emancipation of these remote ancestors of ours came with the discovery of how fire could be used. Then early man could begin to laugh in the face of the vagaries of climate. He could wander, could explore, could live in places which had been uninhabitable before then, because he had the newly found power of fire. Pause to think what it implies, that man is the only animal that can make fires!

It was some 30,000 years, at least, however, before man began to make much use of the power over his environment which fire and his other accumulating inventions could give him. He still got overheated in the summer, and had a dose of the spring fever each year, following his usual winter siege with the common cold.

Even when scientists had found out, the average man did not give much interest to such "odd facts" as that clerical errors increase by 60 per cent when the temperature rises to 90 degrees F., or that, in general, mankind is pretty sensitive to several varieties of weather changes and characteristics. Nor does it happen to mankind only: the grasshopper is silent when the temperature is less than 62 degrees, and the wonderful little Chinese cricket is even a better gauge of temperature. This cricket begins to chirp at 42 degrees; when it is 55 degrees, he chirps once a second; at 69 degrees, it is twice a second; at 81 degrees, he has speeded up to three times a second; and when the temperature hits 94 degrees, he beats a steady tattoo of four chirps a second.

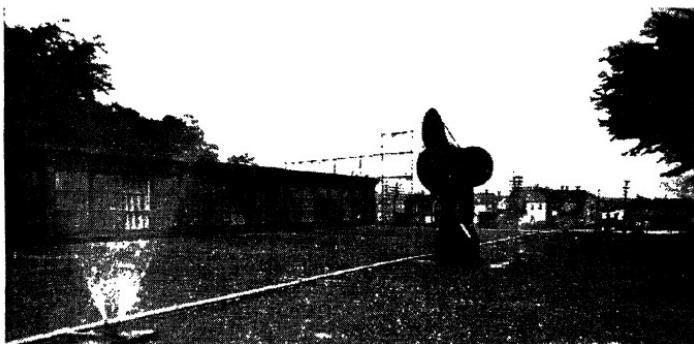
More about insects before we turn back to see in what ways man, too, is a creature of the weather! There is our

household friend, the scurrying cockroach, whose learning and memory were studied recently by Dr. Walter S. Hunter, at Clark University. Dr. Hunter chilled his cockroaches in the icebox, then let them recover from their ice-age period. His roaches were slower to learn and had poorer memory after this chilling, even though they were given a chance to "recover" from their glacial experience before their formal academic tests were given. Strangely enough, however, two hours in the icebox did not upset their intellectual powers, if we may call them such, as much as four hours of hibernation on a cake of ice.

The birth rate of white rats is profoundly influenced by artificial weather changes, according to the experiments announced recently by Dr. C. Ogle. A warm, moist environment was found to lower the number of litters, to decrease the number of babies in each litter, and to yield rather a weakling lot of offspring. "Most efficient sex functioning comes with a steady cool environment," Dr. Ogle reported. "There the greatest number of matings result in conception, large litters of healthy offspring are born, and the onset of sexual life and fertility in the young come earlier than in the moist heat." Any country physician might have told as much in advance, especially when we recall the general practitioner's maxims about a cold winter giving him many summer and fall babies to care for.

The physiological psychology which accounts for many of the influences of weather on man's own show is not understood. It is generally thought, as we have seen, that these influences depend upon some application of van't Hoff's law of chemical action, that chemical activity increases as the temperature rises. There is more than just temperature involved. The amount of moisture in the air affects mankind. So does the condition of the air, whether it is moving or quiet. So does the direction of change in the temperature.

If we were cold-blooded animals, we might not be concerned with all these climatic variables. But since we are animals maintaining a constant inside temperature through all sorts of weather, it is obvious that our temperature-regulating mechanisms are busier than a furnace thermostat which is all out of adjustment. In cool places our own body thermostats make changes to keep us from losing body heat.



The inside of this factory is kept cooler in summer by the simple procedure of spraying water on the roofs throughout the day. The evaporation of the water is cooling, just as gasoline feels cool to the hand. (*Courtesy of Dennison Mfg. Co.*)

In hot weather they shift the blood to the surface of the body—perhaps to cool it after the fashion of the automobile radiator—and make us perspire, to lose more heat in the drops of sweat. As air conditions shift in one direction or the other, there are hosts of rather deep-seated changes which take place in almost instant response, so that the inside temperature will remain the same through all the ups and downs of the thermometer and the barometer.

Knowing these things, we can better appreciate the significance of the statement made recently by Dr. W. J. Peterson, of the University of Illinois, relative to weather and sudden death. "The outstanding weather change that affects us," said the professor of pathology, "is a rising barometer." Delving through sheets and charts of statistics, he pointed out how in Chicago, in March, a month of sudden

weather changes, there are 100 unexpected deaths from heart attacks and only 8 similar disasters in August.

People seem almost instinctively, albeit unintentionally, to have protected themselves against adverse weather conditions, even when the thought of automatic air conditioning was still in the womb of time. Stores on the east side of a street have always enjoyed good business in the forenoon, while it is the stores on the west side which get the bulk of the afternoon trade. Why? Simply because the woman shopper "just naturally" goes on the shady side of the street. It is as natural as turning up one's coat collar in the teeth of a gale; and wise purchasers of business real estate and the property departments of the chain stores have always considered this in selecting sites. In 1934 the chain stores installed some two million dollars' worth of air-conditioning equipment, to make the inside of their business places as attractive as the shady side of the street.



I find that many people imagine the trouble with air is that there are "poisons" in it. Such is far from the truth. The worst air in the world, in fact, is the air in our own lungs. Not even in the average underground mine, though, is it necessary to add oxygen or to extract some mysterious poison. Not even the odor of the air has any effect other than unpleasantness, unless some ammonia pipes happen to have broken. What is important is that our air should have a temperature of close to 67 degrees, a motion of some four or five miles an hour, enough moisture to about half saturate it, and freedom from dust, soot, and other obviously irritating impurities. That is a rather simple bill to fill.

Under some circumstances, which are really exceptional, the oxygen content does have effects, but air-conditioning equipment does not take care of this as a rule. At high altitudes, as in the Rocky Mountains or on stratosphere flights, the oxygen in the outdoor air is less than the sea-

level concentration of 20 per cent oxygen. For this reason transcontinental motorists have to change the adjustment of their carburetor. And the tourist finds that he strangely "gets out of breath" more quickly after a little exertion, just as he has to boil his potatoes many minutes longer than usual before they are cooked.

Under extreme experimental conditions, where oxygen breathed in has been vastly reduced, Dr. E. Gellhorn and his associates found recently that negative after-images were noticeably reduced. This reflects a rather profound effect upon such marked deprivation, but is of no practical significance, even to mountain visitors. Temperature, motion, moisture—and a little change from day to day, or hour to hour—remain the things that we need to make us independent of the whims of the outside weather.



The weather itself, of course, changes through the decades. Dr. C. A. Mills, professor of experimental medicine at the University of Cincinnati, who has followed through the weather at St. Paul and Washington since 1855, finds evidence that our "average" weather is gradually becoming milder. This may have some relation to the fact that our years are each twenty-five minutes short, so each succeeding year a new season starts, according to the calendar, twenty-five minutes earlier than the corresponding season the year before. Figure this out on the back of a very large envelope, and you will find that in some 10,000 years our seasons will be reversed, and we shall press the heat button in July and the cooling button in January.

Interesting and significant are the somewhat localized changes in weather. Take Palestine. Some four thousand years before the Children of Israel sought the Promised Land, it was mainly a dry, barren desert. Earlier than that it had been heavily wooded, and almost inundated with rains. Changes in weather conditions such as these have prompted the formation of a school of geographers, under

the banner of Dr. Ellsworth Huntington, of Yale University, who see in the changes the reason for the rise and fall of various peoples and countries. They have a convincing story to tell, but one which modern inventive progress in the past decade has probably removed as a source of decline for the present generation.

Dr. Huntington has made an exhaustive study of the effect of weather and climate on human efficiency. He conducted an investigation among 2,500 workers in Connecticut, North and South Carolina, Georgia, and Florida, and among all the students of the United States Military Academy at West Point and the United States Naval Academy at Annapolis.

He found that the mild months—April and October, particularly—seem most conducive to efficiency in both mental and physical workers, and that temperatures averaging between 55 and 65 degrees are best; that is, times when the average daytime temperature is about 75 degrees, dropping to 45 degrees at night. Mental workers seemed to do better at lower temperatures—when the thermometer reached 55 degrees by day and dropped to freezing at night.

Neither class of workers did well in either excessively hot or excessively cold weather. As soon as the average temperature dropped below 30 degrees or rose above 70 degrees, there was a definite falling off in efficiency—as much as 60 per cent when the thermometer reached 90 degrees or more.

The effect of temperature on efficiency varied, of course, according to location. Thus, workers in Florida, accustomed to relatively higher temperatures the year through than workers in New England, were able to withstand temperatures above 90 degrees without any such loss of efficiency as the Northerners showed for corresponding temperatures.

Now, from this you might assume that you can acquire independence of the weather by seeking a uniformly mild climate and living and working there the year around.

Huntington's test, however, shows that the weather problem is not so easily solved. Where there is little change in temperature from day to day, he found that the quality of work gradually declines. The human body requires change, and a change in the weather, whether for better or worse, invariably was found beneficial. Even a rainy day after a long spell of fair weather was a mental and physical spur. Similarly, either a rise or a fall in temperature increased productiveness, except when the change was very great or very sudden.

It is on this liking of your body for change that the beneficial effects of a summer vacation depend. Merely resting from your accustomed labors for a couple of weeks in the summer will benefit you, but the best vacation is one that includes a climatic change. The man from inland who visits the seashore, and the man from the coast who goes to the mountains, both subject their bodies to unaccustomed climatic influences, with the result that their physical processes are stimulated and they return to their homes refreshed and invigorated. Moreover, their return is itself a change after a period passed elsewhere, and the benefits of the trip to the country are multiplied correspondingly.

One class of workers brings about its own weather changes through virtually the whole year with most satisfactory results—the class made up of salesmen and others who pass part of their time outdoors and part indoors. Usually they are conspicuous for their energy, and it is quite conceivable that this energy has part of its source in their frequent exposure to widely varying temperatures and other weather conditions.

Besides temperature, humidity—the moisture in the atmosphere—has considerable effect on working efficiency. As a general thing, moisture in the air increases our supply of energy, perhaps by helping the chemical action of our bodies, perhaps by making us more comfortable. Excessively humid days, however, lower the working efficiency, probably because they are very hot in addition to being very

moist. The air in winter ordinarily is moist enough, and winter in consequence should be an admirable time for work. That it is not, probably is due in great measure to the fact that most winter work is performed indoors, where artificial heating dries the air.

Stout persons generally are supposed to suffer more from hot weather than their slim neighbors. Possibly they do, in point of discomfort; yet the United States Bureau of Mines determined recently that some fat men actually stand the heat better than lean ones. Among a group of men tested for their physical reactions to extremely high temperatures, the heavier and stouter men lost more weight than the lighter and thinner ones; yet they were able to stand the high temperatures for a longer time and complained less of exhaustion when the test was finished.

There is, of course, the related and highly practical matter of clothes to help us keep cool, but that belongs in another chapter. But we can all think cool, if we cannot just yet enjoy the refreshing comfort of automatically tempered air wafted into our living rooms by day, and into our bedrooms by night.

Whenever you find it difficult to think cool, recall the Duke of Cambridge who was famous not only for being a member of the "Marlborough House set," but who also was well-known in his day for a picturesque fashion in which he made himself independent of the weather. This old commander-in-chief, both friends and enemies averred, reviewed his troops, mounted on his charger, wearing a resplendent Field Marshal's uniform, and sheltering himself from the rain by an enormous but dilapidated three-shilling umbrella.

CHAPTER 21

DRESSING FOR EFFICIENT WORK

"Clothes make the man" in respects more vital than mere appearance and fashionable acceptability. It is true that a slender man looks more stout in a double-breasted coat, or that suiting with a vertical stripe makes the short man look taller. But these are not especially vital factors. There are rapidly accumulating research and scientific opinion which indicate rather definitely that clothing may almost remake the course of human history.

This newer knowledge helps one to understand why we make more mistakes in summer, why we have a growing number of nude societies, why the Alps are healthful, and how to keep cool in summer; it also makes us pause and wonder about man's place in the decades to come. White civilization at present is dominated by the male. History records numerous places, however, where women have dominated. The explorers bring back to us even now reports from remote places where women dominate. The newer knowledge about clothes may make us wonder whether a female-dominated civilization is to become universal in the not so distant future. Women are fast increasing in the field of industry, and already are giving the mere male warm competition there.

For years it has been known that slightly more boy than girl babies are born. Boy babies are the more delicate, however, and there are more early deaths among them. By the time the high-school age is reached, the birth ratio has been altered so that there is an excess of females. As years go on, this ratio is changed still further, industrial accidents eliminating more men than women; disease also reduces the number of men more than it affects women.

Total numbers alone will not necessarily determine which sex will dominate. We see a small handful of Englishmen dominating dark-skinned India. Vitality and general ability are fully as significant as mere numbers. And on this point, also, modern science would bode a change to a dominance by the so-called gentler sex.

His Majesty's medical inspectors have just reported on thorough studies of English boys and girls who are entering industry. They report definitely that the girls are much better developed physically. It has been shown for many years that, although women do not usually have the muscular strength of men, they are in the long run possessed of greater physical stamina and resistance. The royal medical inspectors are inclined to attribute a large amount of this difference to the clothing which is being worn. It is only in the last two decades that women's clothing has differed essentially from that of man; and the puny, almost neurasthenic, woman typical of the eighties seems largely to have disappeared along with the disappearance of several square yards of woolen clothing per woman.

Fifteen pounds of clothing was the average worn by men a few years ago, and, according to the books, women wore "a little more." Men are still wearing about the same number of pounds of clothes, while women's clothes weigh only about a tenth of their former weight. This means that men are still wearing about a tenth of their body weight in clothes. A dog, which seems to stand cold weather remarkably well, carries only about one-fiftieth of his weight in fur.

Man has to pay a price for this extra weight in several unusual ways. Energy has to be used, for instance, to carry the extra weight around, even though the energy is not spent in useful or productive work. Almost one and a half horsepower of work is done by moving fifteen pounds a mile, without regard to direction and the factor of time. In walking a mile, this theoretical additional work is done

Dressing for Efficient Work

by the man, while his fair companion has not dissipated energy in carrying the extra weight.

This excess clothing worn by men also results in their living in a tropical climate next to their skins in both summer and winter, while women live in the atmosphere of the Alps. Tropical climates are fatiguing, the Alpine atmosphere



This glass blower needs a fan for spot cooling, rather than the wool vest he is wearing.

is invigorating. The temperature within the clothing of the average man is 87.8 degrees Fahrenheit; within women's clothing it is only 80.6 degrees. The relative humidity inside men's clothing is 70 per cent, while for women it is only 55 per cent. The observed consequence is that men suffer from heat stasis and from excessive perspiration.

In the cities of the Middle West it appears that men dress more efficiently in summer weather—that is, more coolly—than do the men in the Eastern cities, especially New York City. Fashion and formality lead the Eastern businessman to keep on his coat and to keep his collar tightly closed at the throat, regardless of the weather. If the Easterner leaves off his coat and necktie, no matter how hot and uncomfortable the weather, he seems to feel that he is undressed

and should not be seen around the office. In truth, the man all dressed up has no place in the office in hot weather, yet your typical Easterner worships personal appearance at the price of working efficiency.

It is by a miracle of nature that the temperature of the human body is kept at a uniform temperature, regardless of the external temperature in which it is ordinarily placed. Any marked change in the external temperature throws additional work on the heat-regulating mechanism and on the entire metabolism of practically each cell of the body. The body has continually to radiate heat in order to keep its temperature at the healthful constant of 98.6 degrees Fahrenheit. When the environment has a higher temperature, higher humidity, and the air circulation is lessened, the cooling power is hampered. Regardless of the room temperature, it is apparent that men's bodily mechanisms have more strain in keeping body temperature at nature's point, due to the secondary air environment created by their clothing.

Thus basal metabolism is lowered, a load which may reach dangerous proportions is thrown on the sweat glands, and this affects the water distribution in the body and may influence kidneys and other vital organs.

These conclusions are not based simply upon scientific logic, although the logic is plain. These effects have been observed by such men as Dr. E. S. Sunstroem, of the University of California, who has studied the white population of Queensland, Australia, and more than 700 white rats in especially equipped rooms where temperatures and humidities could be produced at will. Dr. Leonard Hill, the eminent English physiologist, has also noted these conditions and is urging radical changes in the clothing of men. Dr. E. Friedberger, of the University of Greifswald, recently presented at the Berliner Gesellschaft für öffentliche Gesundheitspflege conclusions of a long study of clothing

which were essentially the same as outlined in this chapter.

How well sunlight could reach the bodies of men and women was given especial emphasis by Herr Doktor Professor Friedberger. Using strips of paper which were sensitive to light, he discovered that much light reached the body surface of clothed women, but that the sun's rays do not penetrate men's usual clothing. They will penetrate just a shirt, but if it is covered with a coat, practically no light reaches the body surface of a man. Admission of air is of importance, as well as vitalizing light rays, and in this, also, the clothing of men extracts a penalty.

Ultraviolet light penetration through ordinary clothing materials has been studied intensively by the Bureau of Standards of the Department of Commerce. They find that rayon, batiste or nainsook cotton, and linen allow more of these rays to pass through than do pure silk or wool. When the materials are dyed or slightly yellowish with age, the passage of the ultra rays is cut down. Woolen goods is only about half as transparent to these rays as is white cotton.

The weave of clothing also affects its transmitting power. Crocheted or knitted weaves allow most light, and also air, to bring their benefits to the surface of the body.

Better than an overdose of ultraviolet rays, as on the seashore with its annoying first day's sunburn, is a continual mild exposure, such as would be given by the correct selection of clothing. Much of the benefit from resting at the seashore comes from the ultraviolet baths taken on the beach, although this should not be overdone the first few days. Other advantages which make people erroneously think that sea air itself is intrinsically bracing come from the breezes which unburden the heat-regulating machinery of the body by removing the layers of stagnant air between body surface and outer clothing. Lounging at the shore in a

wet bathing suit throws too much strain on the heating plant.

Perspiring in hot weather is a good way to keep cool, since each pint of sweat means that the body has been relieved of about 500 calories. But a few people do not perspire. These unfortunate few should drink hot beverages in warm weather, since extra perspiration is induced by the hot liquid. Everyone drinks more during hot weather, and adding just a pinch of ordinary table salt to the water is helpful, since it replenishes the abnormally high loss of salt from the body during summer perspiring.



Thomas A. Edison always had a fan with him in hot weather. You may never have seen it in his photographs, but it was always there. His loose clothing amounted to a fan, since it allowed minute air currents to displace the overheated air near the body surface. On an especially hot day, the best way to keep cool is to keep the windows closed to prevent hot outside air from entering, to pull the shades to keep out the heating rays of the sun, to turn on an electric fan, to keep calm, and to wear loose clothing.

Food should also come into consideration in a talk about how to keep cool in hot weather. Fruits, salads, green vegetables, rice, fish in moderation, fowl, and dairy produce are the best.

A man will be cooler in summer if he wears suspenders rather than a belt; but since he should also go without a coat, he may feel conspicuous if wearing suspenders. This dilemma is easily solved by wearing invisible suspenders, and a very loose belt. The belt does not add to discomfort from binding the blood vessels, but rather by stopping the circulation of air within the clothing. Tightly fitting garters do hamper the blood stream, as well as quickly becoming unsanitary themselves. A good grade of men's hose does not need garters to keep it looking trim. If supporters are necessary, because of thin calves, preference should be given to

those which clamp to the shirt and do not constrict the leg, and which, incidentally, keep the shirt trim and secure when the coat is sensibly left off.

Ventilated Oxfords are unusually comfortable shoes. I have worn them for years, during warm weather. The more holes in them, the better!

If constriction is an important item against the garter, it should annihilate the tight-fitting starched collar entirely. Collar manufacturers have been having trouble finding a market lately, and perhaps men are at last rationally revolting against this last remnant of the corset, which was originated as a protection against lance and sword thrusts. The blood vessels in the neck are large and limited to a small area. They are the important vessels which carry great quantities of blood to the brain. Constricting them quickly produces death, as Japanese sailors know who will eliminate an enemy by lightly pressing on these vessels while he is asleep. Many Japanese and Chinese sailors have been discovered dead in bed with only two tiny finger marks showing how death was caused.

"Whenever you suffer from headache," says Dr. Royal S. Copeland, "my advice to you is to loosen the collar."

In addition to checking blood circulation, the tight and stiff collar prevents the free circulation of cooling or refreshing air currents over the body surface. Tight pajama belts affect only circulation, but that is enough. The collar, garter, long underwear, and lined clothing result in leaving only the face and hands of men exposed to the sun and air.

In the case of a woman, fully a third of the body surface is exposed mildly to sunlight and ultraviolet rays, while practically her entire body surface is continuously ventilated by air currents. She is much better physically and mentally because of this. So we find Dr. Ephraim R. Mulford, president of the New Jersey Medical Society,

saying: "Today our American women are in better physical condition than our men."

It was only a few decades ago, we remember, that Mary Walker was agitating for women to be given the ballot, and creating a sensation when she insisted also upon the right to wear men's clothes. She may have been right about the ballot, but she was dead wrong about the clothes.

In the matter of cleansing clothes women again have the advantage, because their light garments and underclothing can be readily and frequently washed at home. It is far from a luxury for a man to invest in enough hosiery and under-clothing to allow a fresh change each day. Shirts should be allowed to air alternate days. Clothes closets should be provided with ventilators which permit outside air to enter, keeping the clothes in a more sanitary condition as well as making life a bit more miserable for moths.

Why people started to wear clothes has puzzled science for a few generations. Some think that the custom was started by women who wanted to make themselves attractive. Whether or not this is the reason why the wearing of clothes was started, it tells us much about why women wear the kind of clothes they do. Another theory advanced to explain the beginning of clothing is that it was adopted to keep people warm. Still another theory is that clothes were invented because people began to feel immodest about their nudity. This is difficult to accept, because among isolated tropical peoples who wear no clothing, it is considered immodest to hide the body; the general principle is that any sudden change in clothing is considered immodest, and it is certain that if immodesty means attracting unwarranted attention through dress, a sudden change would cause such a reaction. Another theory, recently advanced by Dr. Knight Dunlap, is that clothes originated in tropical regions and were at first shreds of rushes which served the purpose of chasing flies.

Whatever the origin of clothes, we can agree with Langdon-Davies who has said, "The fact that we value people

by their clothes, judge them by their clothes, fall in love with them by their clothes means that all sorts of unfortunate results might happen if our standard of judgment, the cynosure of the eye, suddenly disappeared."

Regardless of how clothes originated or what would happen if they were suddenly changed, it would be best for us to heed the warning notes being sounded along many lines of scientific research, which indicate that clothes may ruin man unless fickle fashion or common sense should bring about a change.

Women are just as intelligent as men, and are capable of doing the work of industrial executives, as great numbers of them have shown. With their equal brain power, their dress, which adds to their mental and physical efficiency, may give them an increasing advantage over men in directing our civilization.

"By 1975," says Dr. Walter B. Pitkin in discussing the decline of the American Mind, "the present supersalesman and high-powered executive will have gone. Some quiet spinster, with a world radio telephone at her elbow and an automatic statistical computer in her office, will handle more big business in a morning hour than such gentlemen get through in a week of golf and highballs at their country clubs!"

CHAPTER 22

CONTROLLING THE NOISES OF BUSINESS

Noise is a two-edged sword in business. It cuts into sales, and it cuts into production. For the individual it may cut into health and well-being.

Evidence to support these rather dogmatic statements will be offered shortly. The statements would be little short of sensational but for the mitigating fact that most noise is preventable, as will also be seen shortly.

Noise affects sales, because human beings prefer pleasant experiences to unpleasant ones, because many executives are getting "warm under the collar" on the subject of noisy offices and workshops, because manufacturers with a quieter product are using its quietness as a forceful sales point, and because physicians' organizations and public health officials are steadily and with increasing momentum educating the public against noise.

If I were a capitalist, I think the growing tide of noise consciousness would prompt me to invest heavily in anything that had quietness far beyond its competitors; and if I were a manufacturer, I would have fully half of my development staff working to engineer noise out of my products. (Someone asked me recently what I would do if I made canned soups; but that is irrelevant and immaterial.)

That noise can be engineered out of a product is shown admirably in the field of electric refrigeration. When the General Electric Company brought out their model which was advertised outstandingly as being quiet, a justified panic seized all other manufacturers in the field. General Electric gained a tremendous initial lead with a start from scratch, but the others went frantically to work

Controlling the Noises of Business

to take out of their machines some of the noise which was costing sales. Most of them succeeded almost beyond expectations. I was in with them on the struggle against noise and know that it was a frantic struggle, with the bankers keeping a close but encouraging eye on every day's progress.

. On few other problems of management is there so queer and unwarranted a combination of beliefs as in the case of noise.

Industrial noise is not going to make the human race deaf, as we occasionally hear, although there is a tendency for an excess amount of premature dulling of hearing among workers in the more noisy occupations, such as boiler makers and punch press operators. Neither will industrial noise be sure to drive mankind into a collection of nervous wrecks, although nervous individuals are inclined to notice ill effects from industrial noise more than do less sensitive persons.

The belief that noise can be lessened or controlled by stretching wires across the office, or by setting up a "counter-noise," is without foundation in workable fact.

Wires and queer coffer-shaped arrangements have been used with a superstitious belief in their value for lessening sound. There are some venerable churches with five miles of wire each, stretched in their rooms to lessen the roar of a voice, when as a matter of fact the total effect of fifty miles of wire, whether stretched or loose, would be precisely of zero value. Getting rid of noises which produce fatigue and annoyance is a more common-sense affair than these mysterious wires and coffers, which remind one of perpetual-motion schemes.

Although these beliefs are ill-founded, it must be recognized that both laboratory work and actual industrial records show: *first*, that preventable factory and office noise does cut into output; *second*, that in addition it

appears to have demonstrable ill effects upon the average worker; and *third*, that engineering can so reduce the noise level in the typical establishment as largely to prevent the loss in output and to improve the worker's welfare.

Some recent experiences will give a dramatic illustration of these points. The directing executive of a small concern was contemplating moving their offices into the country to get away from the noise which bothered him personally. There would be some savings and some losses from such a move; these practically balanced each other and the decision hinged upon whether or not the freedom from noise in the country would produce a saving.

A brief survey showed that the move would bring no saving from noise reduction. They would take their noise with them. Although the small town they had in mind as the proposed site was vastly quieter than the city location, their own office operations were the chief cause of their noise problem. The traffic noise which entered their present offices was drowned out by the noise of their own office machines. We may draw two unpleasant general morals from this experience: most businesses cannot run away from noise, and most businesses are working in glass houses and should not throw stones about noise.

Then there was a remarkable life insurance solicitor who worshiped at the shrine of efficiency and produced about a million dollars of insurance each year. He ate, worked, slept, and took his systematic exercise, according to a careful schedule. His small office was presided over by a combination secretary-clerk, who constituted his entire staff. He wanted the noise in his office reduced for the benefit of this staff. Study showed that little outside noise came into the office, and that the file cases and the single typewriter and adding machine were the principal sources of noise. The noise was rarely loud enough to constitute a menace to the stenographer-clerk's well-being,

although it may have cut into production. In brief, it was one of those borderline situations where it is difficult to determine whether or not noise reduction is an economic venture.

But it was recommended that no noise reduction be adopted, because the secretary-clerk was never working at top-gear, scarcely three-fourths of her time in the office being spent in productive work. In addition, the solicitor did practically all of his work in the offices of other persons. Had he been a lawyer, architect, physician, or engineer, who did most of his work in the office, then noise reduction would have been desirable since noise appears to have a more marked effect upon so-called creative thinking than upon routine office or factory operations.

The large number of sources from which noise is generated in work is commonly overlooked, and rather amusing attempts are made in consequence to produce quieter and more efficient working conditions. The worst noise-maker in the office is thus blamed for more than its just and due share of disturbance.

For example, an office manager in Saint Louis, tried to accomplish a needed reduction in noise in a general office by replacing some admittedly noisy machines with quieter ones. The result was practically negligible. This was because he had not analyzed his noise problem adequately and had mistakenly thought that the noisy machines were responsible for all the noise. He had overlooked the sounds coming from outside traffic, dictation, file drawers, foot-steps, ventilators, telephones, from production machinery on the floor above, and from other office machines, as well as from less obvious sources.

Several hundred dollars' worth of quieter machines produced a barely perceptible lessening of noise, due to the neglect of these other sources. Noises do not add together like dollars or packages: two machines are not necessarily twice as noisy as one. Noises do not subtract mathe-

matically: quieting half of the machines may produce no practical result. Each situation should be analyzed individually. In some instances benefits will arise from quieting the noisier machines; in others, a useful reduction of noise can be accomplished only by general absorption by an acoustical material.

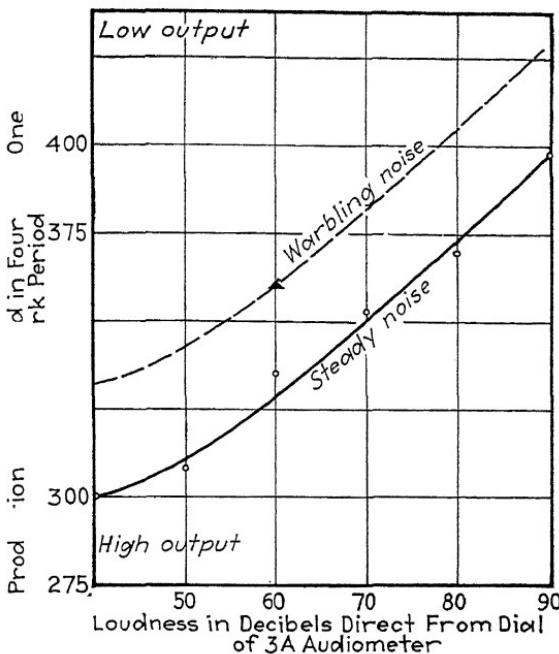
An acoustical installation for blotting up reverberations and thus lessening the noise may also be misleading on



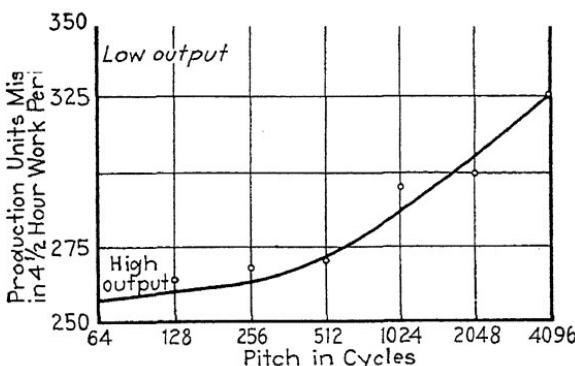
A Tom Thumb factory used in laboratory studies of the effect of different noises on worker production. Dexterous repetitive work is reproduced by this apparatus. Behind the little window in front of each worker there is an endless tape which is perforated with irregularly spaced and sized holes. As these holes appear in the window the workers touch through them with the electrical stylus in their hands. Efficiency is measured in the number of holes they miss while the "conveyor" steadily passes in the window.

occasions. One New York State company had the ceiling, side walls, and supporting pillars of their new office building covered with sound-absorbing material, which was a sensible investment under their conditions. The appearance of the surface of the material was not what they desired however, so it was painted. And when painted, it lost practically all of its sound-absorbing properties.

How much noise is allowable is somewhat of a question at present. There are indications that a little noise has a stimulating effect upon production, just as a busy worker



How output in the Tom Thumb factory fell off as the noise surrounding the workers was increased. (Courtesy of *Journal of Applied Psychology*.)



How output in the Tom Thumb factory decreased as the workers were bathed in high-pitched noises. The noises were all of the same loudness, but varied from bass to soprano in pitch. The soprano noises had most ill effect on production. (Courtesy of *Journal of Applied Psychology*.)

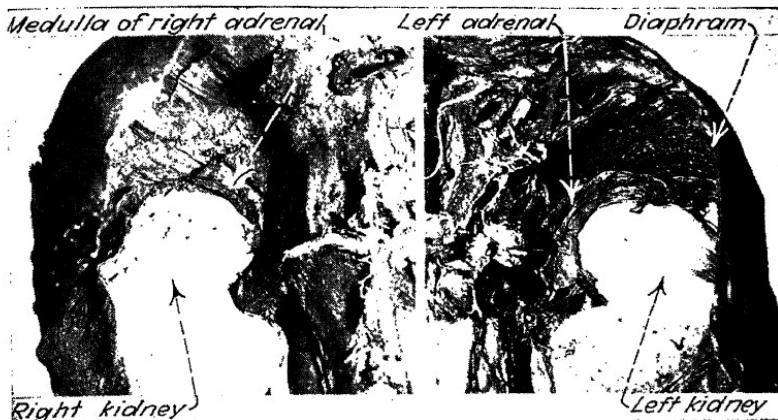
stimulates others to emulate the good example. There are indications, also, that noise much louder than ordinary conversation cuts into production.

Skilled typists, studied in the laboratory, had their typing speed increased by slightly more than 4 per cent when the reproduced office noises in the test room were reduced from fifty decibels loudness to forty decibels. (The average Pullman car noise is just under fifty decibels.) This improvement in output by reducing noise was so marked that many persons were inclined to believe there had been an error in the experimental setup.

One insurance company repeated the experiment on a large number of their workers engaged at a variety of office tasks, and found that over a period of several months a reduction of the noise by approximately the same amount as in the previous experiment produced an increase of more than 10 per cent in output. As a result of their decided verification of the laboratory results, the insurance company invested in the neighborhood of \$200,000 in noise reduction in their office building.

Factory records are more spectacular. An authentic case has come to me recently from Germany, where a group of experienced workers assembling temperature regulators had an abnormally high percentage of their assemblies rejected at inspection. Dr. Sachsenberg was called in as consultant. He found no fault with the workmen, but did find fault with the noise that filtered into their room from an adjoining boiler plant. Moving the assemblers to a quieter workroom resulted in the rejections dropping to the low figure of 5 per cent, and the output increasing more than 30 per cent. In another instance, doctoring loose bearings on a noisy ventilating fan and arranging noise-absorbing baffles to take up the noise of the blades cutting the air, raised production at once by 12 per cent.

Why noise cuts into production and employee welfare puzzles many who are not initiated into the mysteries of acoustics. In a room that has noise just slightly louder than ordinary conversation, extra effort is required to listen to spoken words and extra effort is needed in order



The fear reaction produced by the right kind of noises is similar to the bodily changes which accompany overstimulation of the adrenal glands. The photograph on the right shows the crescent-shaped adrenal on top of the left kidney. Note particularly the artery running down the center of the adrenal, and the additional generous blood supply at the tip and base of the adrenal. In the photograph on the left, the blood supply has been removed from the other adrenal, and a portion of the adrenal itself removed to show the light-colored central portion of the gland, its medulla, where adrenalin is secreted. The adrenalin is picked up by the rich blood supply and produces the bodily changes of the fear reaction. These are unretouched photographs of specimens prepared by special coloring methods in the author's personal laboratory. (Copyright 1935, D. A. Laird.)

to talk. This is admirably illustrated in the fatigue caused by conversation on a train.

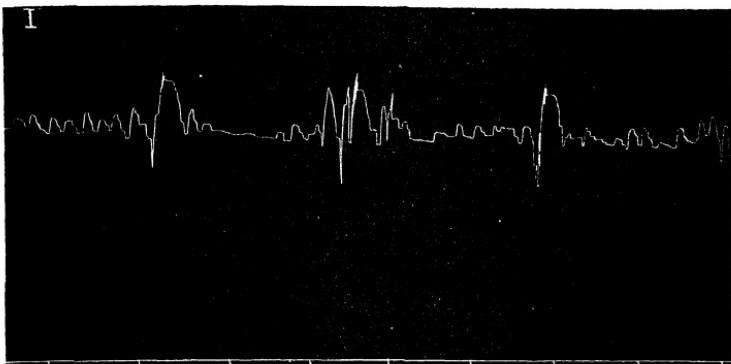
In addition to this rather obvious cause of fatigue by noise, there is the less generally understood physiological fear reaction caused by noise. Everyone is familiar with the disturbed inner sensations following the noise of a tire blowout or an unexpected pistol shot. Our present knowledge indicates that to noise slightly louder than that heard by the passenger in a Pullman car, there is a similar definite physiological fear reaction, with increased muscular

tension, diminished stomach contractions, and altered blood pressure, as the outstanding elements. When such points have been demonstrated, this aspect of noise as a cause of lessened production is also obvious.

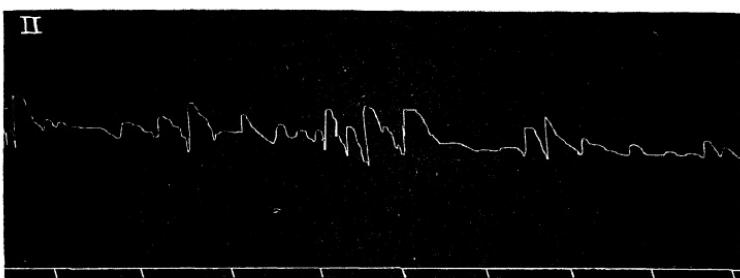


Apparatus for measuring the effects of the fear reaction caused by noise upon stomach contractions. The volunteer subject, left, has swallowed a small balloon which is attached to the tiny rubber tubing which can be seen emerging from his mouth. This stomach balloon is inflated slightly, so it is in contact with the stomach walls, and each contraction of the stomach changes the air pressure in the recording system. The changes in pressure are recorded on the smoked paper drum by a light aluminum writing point.

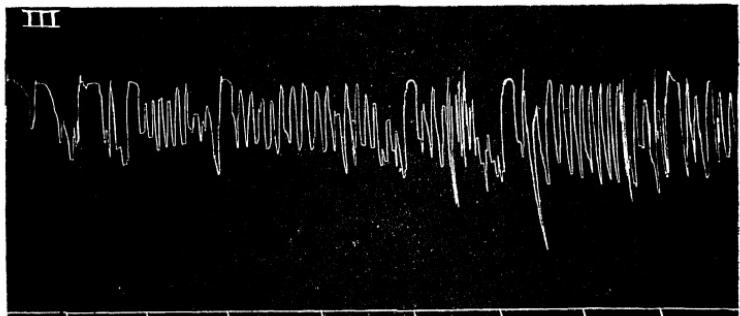
The essential elements of the fear reaction are: (a) Increased tension of voluntary muscles, (b) lessened activity of involuntary muscles in the digestive tract, (c) increased pulse rate, (d) increased blood pressure, (e) diminished secretion of saliva and digestive juices, and (f) a vague feeling of apprehension, sometimes accompanied by restless general behavior. Noises louder than forty decibels, noises that are irregular, and noises that have a preponderance of high pitches are those to which the



Contractions of the stomach under quiet. Subject O. H. Bottom line shows minutes.



Contractions of the stomach under 80 decibels noise. Subject O. H. Note lessened rate and amplitude. The record line being nearer the time line than in I indicates a smaller stomach volume due probably to slight tonic spasm of the stomach under noise.



Contractions of the stomach in the after-period of quiet following exposure to 80 decibels noise. Note overcompensatory quickening and increased contraction heights when compared with record for quiet preceding noise. Subject O. H.

human organism is especially disposed to have this involuntary and widespread fear reaction.

Irregular or sudden noises also draw workers' attention away from their work, interfering with their progress, and preventing a thorough warming up. The tasks have to be started "cold" after each distraction. Some idea of the seriousness of this is obtained from experiments in which the speed of mental multiplication was increased in excess of 30 per cent by quieting ordinary office noises. Part of the feeling of annoyance in a noisy environment is due to this distraction of attention, and part to the vague feeling of apprehension associated with the fear reaction.

An unusual phenomenon which is still to be explained is the feeling of relief that is experienced when a very noisy room is given even slight quieting. Workrooms with an original noise loudness of seventy-five decibels appear to be only half as noisy when the loudness is reduced ten or fifteen decibels. Any reduction of five decibels or more in the direction of the yet-to-be-determined critical point is almost always beneficial both in production and in the feeling of precious relief from noise.

The executive is apt to think of noise and its control in terms of the problems presented by his job yesterday and today. But it is a matter so important and possibly so far-reaching in its bearing upon the development of the human race that it should be envisaged in a broader way than as just one particular office problem.

No one will deny that the age we are living in, whatever else it may be called, is an age of noise. I have talked with editors who attribute the success of the tabloid press to the effects of noise. The remarkable and growing popularity of country clubs and summer retreats beside secluded lakes may be an indication of man's natural shrinking from noise.

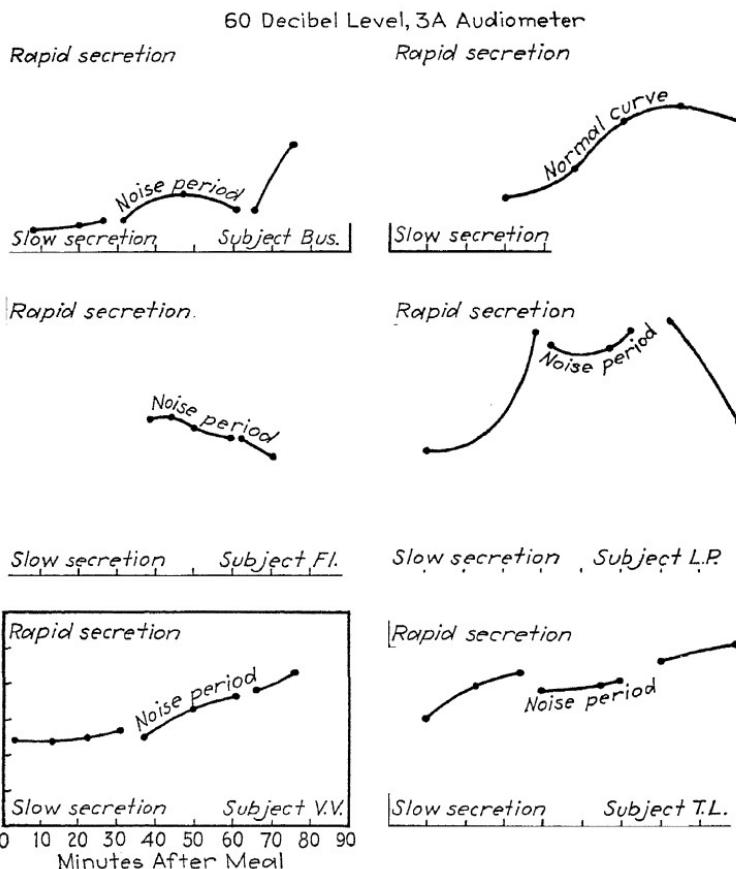
It is certain that we cannot go back to hand operations and that we cannot scrap machinery. We can make machines which will be less noisy, but this does not seem to offer an immediate or even an ultimate solution. Added cost and the increasing use of machines are but two factors which make such a solution seem improbable.

Rather must we look toward lessening fatigue and increasing output by the noise-quieting process of sound absorption. It pays dividends in greater output and lesser fatigue. But I would rather have you look upon noise absorption as a combating of the Age of Noise, into which we have inadvertently been drawn, by the consciously engineered Age of Noise-reduction. It saves you as well as your workers. And it has an important bearing on social life and the progress of civilization.

There are some unmeasurable, but still vital, ill effects from preventable noise. There is one large glass works where gas furnaces were used for melting and annealing the glass. Their roar extended to almost the entire plant. They caused indirect labor loss by making the workers in their immediate vicinity partially deaf, and they generated habits of shouting in carrying on conversation. Workers' wives objected to being shouted at at home. Factory morale in the community suffered. Electric furnaces solved this problem, as well as some purely mechanical problems.

Capable of measurement were the effects of city noise on white rats. The rats kept in relative quiet ate 2 or 3 per cent more food than their brothers and sisters kept in the midst of electrically duplicated city noises; but with only this small advantage in appetite as shown by food consumption, the rats kept under the quiet conditions grew about 10 per cent more rapidly. These scientifically controlled observations on animals are paralleled by measurements of city and country school children, which reveal almost invariably a greater rate of growth among the country boys and girls.

The most startling effect discovered, and one which we hesitate to announce as proven until a duplicate set of



The fear reaction, caused by noise of 60 decibels, slows down the rate of secretion of gastric juices in the stomach. The upper right curve shows the normal rate of secretion for an hour and a half after a standard meal, when the subject is in a quiet room. The other five secretion curves show how, with five different persons, the secretion was slowed up when 60 decibels of noise surrounded them during the second half-hour after eating. This noise made what is usually the highest rate of secretion a period of low secretion. (*Courtesy of Medical Record*)

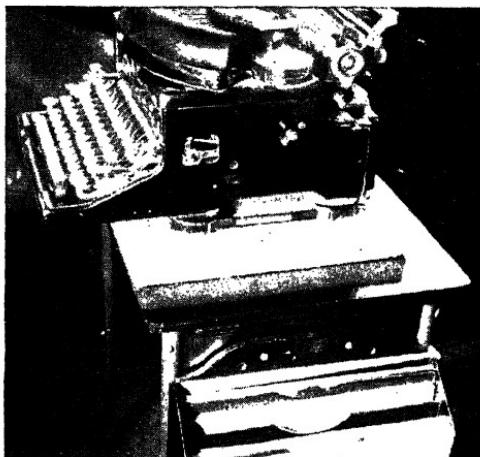
experiments is completed, was in bearing offspring. While we have every confidence in the findings, they are of such serious import that they are announced only with the

reservation that we wish to complete check experiments before stating that the point is definitely proven. No difficulty was experienced in obtaining young from the country rats, but litters from the city rats were more difficult to secure, there were fewer young in each litter, and more than a third of each litter were born dead. A few of the city females died shortly after casting their young, while none of the country females showed the slightest ill effect. Just what caused this profound effect upon bearing progeny can only be conjectured, but is presumably linked up closely with the fear reaction.

So many steps in reducing noise in a metal product are simply a matter of common sense, it seems pitiable that more manufacturers have not reduced their noise by fully half. A belt is almost invariably quieter than a chain drive, for instance. When gears of unlike metals mesh, noise is always lessened; case-hardened steel gears mesh with bronze gears in many of the better-grade foreign automobiles. Then, science has contributed the composition gear, which helps tremendously. The Market Street Railway, in San Francisco, has lessened the noise of the drive gears by cutting a sizable groove inside the rim and weighting it with lead.

Often, only one portion of a machine is responsible for the noise. By insulation with rubber or composition pads, this can usually be prevented from being transmitted to the entire machine and so magnified. This is the case in loosely fitting connecting-rod mechanisms on light and cheap machinery. In such cases insulation with small sections of inner tubes will reduce the noise to imperceptibility. Some day some manufacturer is going to patent this for the typewriter escapement and carriage. A week's examination of almost any machine product will reveal a great number of simple steps which could be taken to lessen its noise and increase its sales appeal greatly. It

may mean using a heavier part in some place, so that it will have enough mass to resist being set in vibration by the impacts to which it is exposed when in action; or it may mean using a channel bar rather than a plain bar, at another place, to accomplish similar results. If I were a salesman for a firm of noise-eliminating engineers, I would ask manufacturers who had not done this: "What would



of sound-absorbing material underneath the author's typewriter
the telegraphing of the noise from the machine through the top and
^ to the rest of the room. Most desks are in effect sounding board
the noise of the machines.

happen to your sales if tomorrow a competitor brought out a machine which would do all that yours now does, and not a bit better, but which would do it almost silently?"

The problems of reducing the noise of workplaces revolve around several phases; (1) cutting down the intensity of the source, as by using quieter typewriters; (2) preventing the noise of intrinsically noisy places, such as the punch press or braiding or weaving rooms, from being transmitted to intrinsically quiet rooms, such as private offices; this involves transmission both through the air and through building walls, where it will travel five to ten times as rapidly as through air; and (3) the

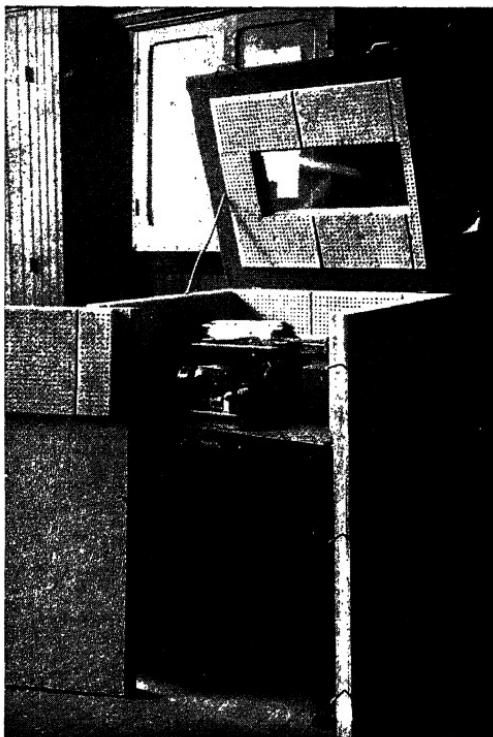
absorption of all noise that remains, to bring the level down to forty decibels.

In attacking the first phase, cooperation with the manufacturer of the machines purchased is essential. The manufacturer can also do much in the design of his product to lessen the transmission. He can lessen transmission through the open air by enclosing noisy sub-assemblies in noise-absorbing materials and try wrapping several layers of thick felt around the electrical accounting machines, to discover how effective this can be. Transmission through the building structure can be lessened by mounting machinery on vibration absorbing pads, if the machine is heavy enough to take a floating mounting, or suspending it between springs if a floating mounting cannot be used. It is obvious that these methods also prevent excessive wear and tear on the building structure itself.

I have seen a small hand-fed press, bolted to the floor of a new concrete and glass building, rattling half of the windows on its floor, while beside it stood a high-speed press, turning out the first 320 pages of a mail-order catalogue, making only a pleasing hum, and not vibrating a window. The big press was better balanced, but in addition to this, it was floated on vibration and noise-absorbing pads. Speaking of windows rattling: have the garage manager wrap the truck stakes with cast-off inner tubes so that they will not rattle in their iron retainers, protect the end gate similarly, and cement a small tight rubber tube around the loose truck chains. It is surprising how much quieter this will make a truck. When the local sheriff has seized a smuggler's truck, look it over for a few pointers on noise prevention.

Back to the transmission of noises! Machinery that is intrinsically noisy should plainly be segregated, to cut down air-borne noises. If it is too expensive to move the machines, an inexpensive partition, selected from the specifications at the end of the chapter, can be built around

the machine for as little as fifteen cents per square foot for materials. Sectional office partitions in some cases have been ludicrously planned, probably where the purchasing department rather than the engineering staff



The noises can often be cut down right at their source, as this sound-deadening housing does at this police department teletype receiver. Messages can be read through the glass window in the cover without opening the housing to let the noise from the receiver fill the office. (*Courtesy of The Celotex Company.*)

had the deciding word. Sectional partitions should reach ceiling high. If they are open at the top, they provide practically no resistance to noises. If noise is a really acute problem, the glass in the partitions should be quarter-inch plate. This does not absorb noise, but does cut down remarkably the transmission of noise; quarter-inch glass is more than twice as effective in lessening noise trans-

mission as is glass only a sixteenth of an inch thinner—and two layers of this glass are better than one.

A room with curved walls is usually worse in its noise effects, since the curvatures have a tendency to focus the reflections, as is done in the whispering gallery in the Capitol building at Washington, where if you whisper in one spot, your whispered words will sound like a broadcast in other parts of the room.

An old auditorium at the University of Illinois has curved walls which have played many interesting pranks through this focusing of reflected sound waves. Several distinct echoes can be heard in the room. On one important occasion, the band resplendent in new uniforms was on the platform playing a welcome for some distinguished guest. The director stood just where one of these echoes was focused into his ears. He began beating in time with the echo, and the echo being a second or two behind time in reaching him, you can imagine the demoralizing effect upon the music when some of the players started following his time, while others were following the particular echo which happened to be focused on their own ears. That was the last band performance in the auditorium before the curved surfaces were treated with building materials which absorbed rather than reflected the sound.

In the layout of machines in a new building, not only flow of work but also noise should be considered. Noisy machines should be kept well away from offices. In case the building is in the shape of an "L" or an "E" or a "U," the noisier machines should be placed along outer walls or at end walls, so when windows are open their disturbance will not be carried to all floors of the section on the opposite side of the court.

Arthur Brisbane and Will Hays insist upon having offices near the very top of the tallest skyscrapers. Such locations are quieter because they are farther away from the street sources of sound, and even the sounds transmitted through the building itself from the street and

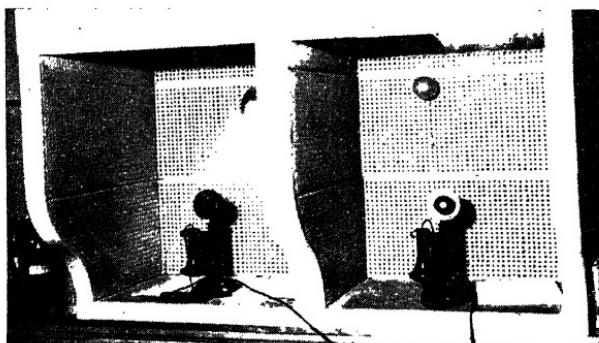
subway levels are greatly spent by the time they reach the fortieth story. The late Joseph Pulitzer achieved quietness in a more effective way, namely, by having a noiseproof room built into his home on Seventy-third Street, New York.

Locations just off the main arteries of street traffic usually rent at a slight discount, when in reality they should rent at a premium, for they have helped to solve many noise problems by their location, unless, of course, there is a factory or an exceptionally noisy office in the building itself. The building on a street paved with smooth macadam or asphalt will be quieter than one paved with brick or cobblestones. Rubber paving blocks are now being used in England. A section that will soon be built up is one to avoid, since the construction noise will take many dollars out of the pockets of nearby tenants, even with the use of relatively quiet electric welding of the steel frame.



The absorption of noise provides the simplest and most effective means of curbing this disturbance, after all other plant or office details have been soundly engineered. Our scientific knowledge of this goes back only three decades, to the matchless work of the late Wallace Sabine at Harvard University. Ordinarily, noises are built up and prolonged within the walls of a room. This is due to the walls usually reflecting 90 per cent or more of the sound that strikes them. They reflect sound better than a mirror reflects light. The sound is reflected from wall to wall in a complicated pattern, losing at most not more than 10 per cent of its strength at each reflection. Thus in a medium-sized quiet room the prolonged reverberation of a handclap can be heard for three, four, five, or more seconds after the sound was generated. This is more noticeable in a room with large cubic volume. Thus arises the advantage in sound control within the plant or office having small rooms.

Some materials absorb more noise than they reflect. They are listed on the table of absorption value at the end of this chapter. Take rugs, for instance; they will absorb about 20 per cent of the noise that strikes them. Another way of presenting this information is that they present 0.2 absorption unit per square foot. A nine-by-twelve-foot rug presents 108 square feet, or 21.6 absorption units. Velour drapes on the windows of the private office



This druggist in Kentucky hears his orders over the telephone better since the baffles of sound-absorbing material blot up the store noise around the telephones. (*Courtesy of The Celotex Company.*)

add to the absorption and quietness. So do tapestries, if they are used in place of pictures and charts on the walls.

There are on the market several patented and effective wall treatments which will absorb as much as 70 per cent of the sound that strikes them. The plant engineering department should have full absorption specifications of these before any purchases are made; and when a bid is once obtained, it should be pro rated per absorption unit, not per square foot. Some of the materials can be installed in place of plaster when a new building is under construction. All of them can be applied over old wall surfaces.

There are also patented window ventilators which are useful on windows exposed to street or plant noises. There are doors which will prevent the transmission of noises.

Floor coverings were mentioned earlier. Linoleums and some semisoft composition floors make quieter places, but they do not absorb noise to any appreciable extent. Their virtue lies in making less noise when heels strike their surfaces, or when trucks are moved over them.



The sound-absorbing ceiling used in the author's personal laboratory. This absorbs more than 70 per cent of the sound waves which strike it.

Hand-truck noise can be as readily eliminated by using rubber- or canvas-tired wheels.

The working girl has helped to bring the misfortune of noise on herself unwittingly in two ways: by no longer wearing goatskin heel trimmings on her shoes, and by wearing less clothes. The passing of goatskin heels added to the noise of offices in an interesting way. The hair trimmed from the goatskin was used to make hair plaster, which absorbed about 10 per cent more noise than does common plaster. When the hair could be bought as a cheap by-product, it was used in quieter buildings.

The reduction in square yards of cloth worn by women has added to the noise strain, since modern dress absorbs less noise than did the clothes of a quarter of a century ago. In the early nineteen hundreds the late Wallace Sabine, who laid the scientific foundations for acoustical work, discovered that the clothed adult of that day presented 4.7 sound-absorption units. Some sound absorption left the office with long skirts. That this is of more than

passing interest is revealed by the experience of a London musical hall, long famous for its perfect acoustical properties, which has just installed many square feet of American-made sound-absorption material to compensate



The windows in the author's personal laboratory are of double sash, and fitted with weather stripping to help keep outside noises outside.

for the loss of absorption due to the changed mode of feminine attire.

The bearings of noise on personal welfare have been barely suggested. Only in excessive intensities does noise

Transmission of noise through partitions

(The higher the average reduction factor, the more soundproof)

Partition construction	Average reduction factor	Weight per square foot, pounds
4" hollow clay tile, plastered on both sides.....	3.36	27.0
2" gypsum tile, plastered on both sides.....	2.95	19.6
1½" solid metal lath and plaster.....	2.53	13.9
2 × 4 studs, wood lath, and plaster.....	2.73	18.0
2 × 4 studs, sound-absorbing wallboard with coefficient of 0.20 as base for plaster on each side.....	3.02	11.5
2 × 2 double studs, staggered, sound-absorbing wallboard with coefficient of 0.20 used as plaster base on each side and extra sheet hanging loose between the studs.....	4.32	12.2

produce premature deafness. But noises above forty decibels do strike vital organic activities by precipitating the fear reaction. Blood pressure is raised; the pulse, altered; muscles of arm and leg and trunk, increased in

How different materials absorb noise

An open window was taken by Professor Wallace Sabine as representing 1.0 unit of noise absorption. The table gives relative values of various building and furnishing materials in absorption of noise *per square foot*.

Acousticalotex, 1½ inch thick.....	0.72
Akoustolith (artificial stone).....	0.36
Brick wall.....	0.032
Carpets, heavy.....	0.25
Celotex, ½ inch thick.....	0.18
Cheesecloth.....	0.019
Concrete.....	0.015
Cork tile.....	0.03
Cretonne.....	0.15
Curtains, velours in heavy folds.....	0.5 to 1.0
Flaxlinum.....	0.55
Hairfelt, 2 inches thick with painted membrane.....	0.40 to 0.70
Insulite, ½ inch thick.....	0.18
Linoleum.....	0.03
Oriental rugs, heavy.....	0.29
Plaster.....	0.03
Wood, varnished.....	0.03
One person, 4.7	
House plants, per cubic foot	0.0081

tensioness; and involuntary muscles in the digestive tract, slightly paralyzed. The patent medicine to overcome these ill effects is less noise than forty decibels intensity.

Experimental developments indicate rather definitely that the idea of "getting used to noises" is largely a myth. It is true that one can consciously ignore noises, but the responses of the fear reaction are reflexly and not consciously controlled. This is dramatically illustrated in experiments where sleepers have been connected to elec-

trical apparatus which indicates the tension of their muscles; simply walking past the sleeper on tiptoes will raise his muscular tension without his making a visible stir. Blood pressure responds similarly. The net result of these changes is that more bodily energy is consumed in working or just living in environment above the critical forty-decibel level.

It has been stated that irregular noises are more devastating than steady noises. Rhythmic musical noises are perhaps in a class by themselves. While there is no scientific or engineering evidence on this phase of noise, the indications from rhythmic work-songs of sailors, for instance, would suggest some value, especially as they suggest a vivacious rhythmic movement.

From the viewpoint of efficiency, too much noise can be eliminated. Too much quieting is a waste of money put into materials and engineering help. This is simply because below a certain point in the direction of quietness there are no measurable benefits from further reduction. It does not mean, as some state, that dead silence is worse than a noisy room. The breaking point in noise intensity, below which further sound reduction does not pay for itself, is about that noise in which one with normal ears can barely hear an ordinary watch held two feet from one ear. From this low intensity to that represented by the noise in a high-grade automobile going forty miles per hour on a smooth pavement, we have what may be called a neutral range. Above this intensity represented by the auto we have a loudness for which definite price has to be paid in quality, quantity, and fatigue. Most workplaces are noisier than this.

While from the viewpoint of efficient production a place can be made too quiet, the converse probably holds in sales design. Every manufacturer might well consider how his machines could be made less noisy, and then make them practically silent before competition gets the otherwise inevitable jump. Through this quieting, he is not

merely gaining sales strategy. More important is the contribution he is making to what the Arkansas parson called "less strainful living."

Much of the agitation for quieter cities and workplaces, however, has all the earmarks of emanating from reformers. In Pittsburgh a few years ago, certain women's organizations were aggressively active in running down all squeaks and squawks. There was a convenient ordinance on the city books which gave power to include bothersome noises as health menaces, and these groups of women constituted a highly efficient body to report every noise they did not like to the health commissioner. For a time they kept him so busy that in one of his annual reports he was forced to state that they had kept him so busy silencing barking dogs and stopping noisy cat fights that he had not been able to do much else during the fiscal year just closed!

A pathetically amusing incident occurred two years ago. A businessman from Utica motored thirty miles to the laboratory to see if he could find some way of getting his private secretary to wear rubber heels, since every time her tall and pointed leather heels struck the concrete floor of his office it set his nerves on edge. He was greatly relieved to learn that he need not speak to his apparently temperamental secretary about this, since carpeting the floor of his office would not only silence her heels, but would also absorb appreciable amounts of noise which filtered into the office from the streets. This particular man was unreasonably annoyed by noise. It was almost an irrational annoyance with him, and I should not be surprised to hear that he had tried to put through a local ordinance prohibiting anything but rubber heels in Utica offices. Doubtless he might, if he could find adequate support.

The chief danger in any scheme of improvement—and the quieting of workplaces and living places properly

belongs among such schemes—is that a few individuals who are almost abnormally sensitive or annoyed may take a militant lead and carry matters to extreme lengths.



A soft rubber ear stopple, made for the use of swimmers, can be used to make noises seem around 10 decibels quieter.



Inserted into the ear, the rubber stopple is a boon for sleeping on trains, for the country person in the city, and for anyone who is especially sensitive to noises.

For instance, a few weeks ago, I received a letter, from a New Jersey resident. He complained vehemently about noise, and went on to tell how the large broadcasting companies were sending out sound waves which followed him

most of the day, and that they often awoke him during the night with more sounds. It was rather obvious that this man was probably on the verge of a mental disorder, and it was a ticklish task to write to him advising in a nice way that he should see a mental specialist. Even an abnormal mind of this sort has possibilities of gathering together a following of reformers who would throw one into chains for smoking the wrong cigarette and coughing outside of a soundproof room.

The way one's attitude determines whether or not he is annoyed by noise is amusingly illustrated by the story told about the New England farmer who was visiting a cousin living in New York. The city cousin was extremely proud of his city and had talked it up to such an extent that the rural cousin in defense was looking for the unfavorable side of all features of city life.

Late Sunday morning, as they were walking along, the great Rockefeller carillon began to peal forth almost directly over their heads. "Isn't that beautiful!" the city cousin shouted in the New England ear.

"What did you say?" was shouted back.

"Isn't the carillon beautiful!"

"Sorry," was the rural response, "but I can't hear you, for them damned bells."

There is always a small number of people, however, who assert that they can work better under noise, in spite of the wide array of scientific information indicating strongly the contrary. Here are excerpts from a letter I received a short time ago from a manufacturer in the state which is also the home of the bean and the cod:

I was surprised that you did not mention any possible beneficial effects of noise. The value of noise was first called to my attention when a friend, and an exceptionally able business manager, placed his office over his factory, when he had plenty of land to place it beside the factory. He told me that the principal reason for placing the office over the

factory was to secure the beneficial effects of the factory noises and vibration in the office. His factory was located outside the business center and he feared that the office would be too quiet for efficient work if alone.

As another instance on the same side of the fence, there is the experience of an executive friend of mine who used to try to work in his office on holidays when the plant was closed. "It will be gloriously quiet there for a change," he would say to himself, "and I can work undisturbedly." But he could not work in the quiet. He found himself listening for noises, and it did not seem to him as if he were in the right factory or even in the right town, for things were so different from usual, due to the absence of the factory hum and tremble.

To the psychologist these, and many other similar cases, do not indicate that noise serves as a necessary stimulus. Rather are they the reflection of the fact that these men, like most of us, have certain working habits to which they are enslaved, and that when one element in the total working situation is altered, even for the better, it is difficult to make an immediate adjustment in those working habits. It is said of a famed woman poet that she could write only when her feet were on the table and when she was smoking a black cigar. The elevation of her feet and inhalations of her cigar were minor elements in the total situation, and without them she left lost. The pangs of grief after the death of a member of the household are accented for the same reason—a familiar element around which many habits revolved is no longer present. Of a verity, the house does seem different in the absence of what was so familiar. So the mere fact that quieter working conditions do not seem right to the person who has become habituated to working in a noisy environment does not indicate that noise is necessary, but rather that he has become used to working under frightening conditions.

"When I first moved to the city," people tell me, "I was bothered by the noises. But now I am used to them,

and they do not trouble me a bit." Scientific workers in several countries who have specialized in studies of noise shudder at this insidious half-truth. It is true that in a brief course of time one will cease to think about the noise, just as one soon stops thinking about the new hat which made him very self-conscious when it was first worn. But the principal hazard which lurks in noise arises not from the amount of attention we give to the distracting sounds in our environment; the graver danger comes from the fact that the nervous systems of human beings are put together so that deep-seated and involuntary changes of a reflex nature take place. These reflex changes affect principally the internal organs, including heart and blood vessels, but they also involve to some extent the entire voluntary musculature of the body.

At most, 10 per cent of the people of the world are responsible for 99 per cent of the world's noise. In America we have the instance of one night-owl truck driver and his machine, which is far too noisy to be mechanically efficient, making more noise in a city block than all the residents combined. But this is not a matter of our machine civilization alone.

In Peiping almost everything is sold by hawkers on the streets. Whether it is day or night makes no difference, there are still hawkers out noisily selling shaves or shirts. Old Moscow did not have backfiring or siren-equipped motor trucks, but it did have cobblestone pavements with steel-tired wheels on the rigs passing over them.

Street traffic is the principal component in city noise. Eliminate or silence New York's trucks, cabs, trolleys, subways, and other noise nuisances, and its streets would be almost as quiet as the Connecticut hills, in which its inhabitants take refuge to relax their muscles and digestive apparatus, and let their blood streams come back to more nearly normal.

At Tremont and Stuart streets in Boston, when there is no traffic, the noise intensity at their intersection is barely forty units, 0 units being inaudible and 100 so intense that it just begins to make the eardrum tingle. But with traffic present, the intensity quickly rises to sixty-five noise units; and the indications are that forty-five units are all that are allowable to avoid the fear reaction. Even with no traffic on this corner, the noise intensity reaches forty units because of noises from other corners which come through the air, and also from the "telegraphing" of distant noises through pavements and connected buildings, for noise will go through cement ten times as fast as it goes through air.

So, when we go to residential sections which are far enough away from heavy traffic arteries for most of the air-borne sounds to have spent themselves, we discover an average noise intensity of twenty units, with an occasional rise to thirty-five when a delivery wagon arrives.

Most downtown city sections have a steady noise of fifty to sixty units, with occasional rises to as high as eighty when an elevated train or a solid-tired truck passes. (The British Chancellor of the Exchequer is now giving tax rebates to trucks that are fitted with pneumatic tires, in recognition of their greater quiet!)

Contrast this city noise intensity with the intensity I recorded in a dining room at the Chicago state hospital where 650 insane patients were eating their supper, an intensity of only forty. Perhaps if any patients in that Chicago hospital read this, they will wonder who is loony now.

CHAPTER 23

THOSE WHO CAN LEAD IN BUSINESS

Early in this book we found that the qualification called general ability has a great deal to do with how far one advances in business and in the world in general. Later we found that there are features of personality which may help or handicap in one's progress in industry. Now we are going to speak frankly about some things which are close to the heart and core of this matter of leading men and women in business (although leading women may be a more difficult problem, which we plan to take up in detail in a later book).

It is easy to give people orders.

But order-givers are not usually leaders. The school-teacher may give orders to her pupils and still be far from being a leader of youth. The housewife may give orders to her maid, and the maid walks out to another job. Leadership keeps people; merely ordering them about drives them away.

One investigator reports that oversized people make the best leaders. Big people may be able to dominate smaller folk, but that does not make them leaders. My observations are that plump ladies have as much trouble with their maids as do the smallish ladies.

There is also more to leadership than being popular. The most unpopular person I know is a splendid leader of a chain of small banks.

It is not personal qualities alone that make one a leader. The charming person may have a wide following, but that is followership rather than leadership. Another interesting aspect of this is that successful leaders differ greatly one from another in their personalities.

For example, Alfred P. Sloan, president of General Motors, and Gerard Swope, of General Electric, were classmates in college. In personality make-up they are so different that it almost taxes the imagination to think that each is the head of a gigantic corporation. They differ widely in personality, but assuredly not in having outstanding leadership. Swope delights in attending conventions; Sloan carefully keeps away from conventions. Swope makes direct and incisive decisions himself; Sloan calls together a conference, to reach a decision.

Or contrast, for yourself, the personalities of Ford and Chrysler. Apparently a man of almost any personality type can be a successful leader, if he knows what the essentials of leadership really are.

Hundreds of American business executives from all parts of the country passed under the psychological microscope in the Colgate Psychological Laboratory, not long since, during a survey of executive traits. The aim of this unique research was to find out whether or not there is a distinct type of human being which can definitely be put down as executive—and hence spotted and singled out in factory, shop, or office—or on the other hand whether there are merely specific traits that tend to make a man an executive leader, irrespective of his other characteristics, such traits, for instance, as a practical, humanitarian, or idealistic bent; looks; manners; taste in clothes; or attitude toward prohibition.

We found that there are certain unmistakable executive traits that all outstanding executives appear to possess, from top-flight individuals down to the youthful leaders just beginning to distinguish themselves among the hosts of oncoming subexecutives, and that it is these traits which make them the keen, efficient managers and directors they are.

Surprisingly enough, these traits were all but complete strangers to the accepted virtues which every great man's biographer lists as the necessary components of business success: hard work, honesty, kindness, frugality, etc. Literature, it seems, is all wrong in the way that it has portrayed notable executive leaders. The psychological microscope shows that it is not the noble, humane, or pleasing personal qualities that make the leader. On the contrary, about half the successful executives studied had a noticeable dislike of their associates, had man-sized tempers, did not know or care much about the home conditions or troubles of their employees, were argumentative and inclined to fly off the handle, and by no means the type that invites others to come to them for confidential, helpful advice. Likewise, the strong executive bragged more than most men, was inclined to be vulgar, was more likely to interrupt others, and was not possessed in any marked degree of the well-known "smooth as silk" personality.

We went at the test with the utmost thoroughness, going over in the first place all available previous opinions and judgments concerning the derivatives or origins of successful executive leadership. As the reader may well know, a truly gigantic volume of material on the subject has rolled through the presses, from the views of idealistic, gentle, academic theorists to those which acknowledged business leaders have expressed as vital for gaining and maintaining such leadership, in their published interviews and autobiographies. Finally, we had a list of 500 traits which we considered, from the consensus of opinion, to be most important. We grouped these under appropriate explanatory headings, such as "Self-Confidence," "Interest in People," "Reputation for Fair Play," "Liking for Hard Work," and "Organizing Ability." Then we proceeded to make up an exceedingly comprehensive report blank, framing the questions so that "Yes" as an answer meant the possession of a given trait or quality, and "No" the

absence thereof. Thus, we had eventually a capital measuring scale for executive leadership.

The next step was to find executives to measure. Talking over this end of the problem with businessmen, we found to our keen satisfaction that business organizations were more interested in the program than you might think. This interest is not hard to explain, however, when you stop to think that our measuring device promised the employers considerable aid in developing satisfactory executives for their organizations, and promised the individual executive a similar help in that it might show him ways of strengthening his own industrial or commercial hand. Finally, through the courtesy of Frank L. Rowland, the National Office Management Association agreed to cooperate with us in this measuring of executives.

Obviously, nothing was to be gained by simply sending the blanks containing the "Yes" and "No" trait questions to the members and letting them fill out their own. As we have seen, we all tend to think too well of ourselves, no matter how scientific we try to be. What we did, then, was to select in each of a number of organizations key men who were, in the opinion of their associates, best equipped to judge others without fear or favor.

To each of these key men we sent a pair of blanks. In turn, each of our Solomons was to select from within his own organization a pair of executives, each of whom had, so far as possible, the same amount of formal education, practical experience, technical mastery of his job, and opportunity to demonstrate executive leadership; but in addition one of each pair was to be a man regarded as a "comer," and the other "just an executive."

In more explicit words, the first was to be one of those fellows for whom the sky is the limit when it comes to promotion, who is generally looked upon as a future Owen D. Young; while the second was to be one of those workers, who, for one reason or another, had seemingly reached the

top of his possible progress, save for occasional raises in pay due primarily to long service.

Having selected his two men, each of our Solomons set himself down and, taking his own good time, analyzed them in the light of our questionnaire. Each subject's faults and foibles, likes and dislikes, personal characteristics, attitude toward life, methods of work and of managing subordinates—and superiors as well—these and other things went down on the big blanks. Some of the managers arose to contend that, after all, the men selected in the pairs as "the fair-haired boys" might not actually be the soundest executives, but on the other hand might merely be such in the judgment of the Solomons. We countered with the argument that in any event "the fair-haired boys" had executive leadership qualities for which their employers were willing to pay a premium; that even if these fortunate fellows did not have what might be called ideal leadership, they did possess qualities which got executive results and rewards. And this, in an everyday world, was the same thing. Our answer was generally accepted, and the process—actually it was nation-wide—went on to find out valid and comparative descriptions of strong and weak executive leaders, of their personalities, personal habits, and ways of thinking, working, and acting. Of course, we took care not to let the executives know that they were under our psychological microscope, and most of them do not know it to this day.

The parade of personalities reflected in the report blanks continued for weeks. The work of checking and comparing the traits of the weak and the strong executives went on enthusiastically enough, because all of us could foresee generalizations of a most absorbingly informative and surprising nature. They pushed up like spring sprouts through the figurative soil of the countless words, words, words that we had previously read about what made

executive success and leadership. It began to appear that we should have a composite of human traits that could fairly be taken as the hall mark of the strong executive leader, even if a composite portrait of such a creature were impossible. This composite of traits loomed up like a kind of half-personality, necessary in the good executive, but at the same time mergeable with any other combination of other traits necessary to make up the total personality. In the fine executive leader, our records began to shout at us, these qualities almost inevitably would appear, though they might be merged with red hair or black hair, Greek or Indian origin, the enthusiasm of the great Theodore Roosevelt, or the bookishness of Woodrow Wilson.

Before describing this ultimate set of executive-making traits, this composite hall mark of the get-things-done leader, let us pause to prick some of the good old leadership bubbles which our data, like a wind, simply wafted out of consideration. Obviously, traits or habits which both weak and strong executive leaders possessed in about equal degree could not be accepted as having contributed to, or even as having strongly affected, the development of the strong executives; not, when so many men were under consideration. Thus we come to the aforesaid bubbles.

Contrary as it is to time-honored opinion, there was no appreciable difference between the capacity for and love of hard work between the two groups; each apparently worked just about as much and with about as great earnestness. The same thing was true as to that so generously praised quality—self-control; indeed, if anything, the strong leaders displayed a greater tendency to get angry and lose their tempers in trying situations, and the weak leaders a corresponding disposition toward patience and emotional repression. And (shades of the fictionmakers and the gentle, idealistic moralists!) there was no clear difference between the groups when it came to being able to appreciate humorous situations or ability to inject an

How to Use Psychology in Business

element of humor into conference or conflict of opinion, with a view to easing off the tenseness of the moment.

Likewise, there was no clear cleavage when it came to these much-lauded and properly admired personal attributes:—giving others credit, avoiding carping criticism, keeping in good condition, setting a good example, or avoiding intimacies with associates or subordinates. Thus, the sanction of careful research may fairly be said to have been placed on the statement that the tendency to be like the strong, silent men of fiction does not help a man to be an executive of high caliber in everyday business or in politics; nor is it a valid sign of executive leadership. So, also, with the habit of long, arduous hours of work; humor; being generous with credit for accomplishment on the part of others; avoiding dissipation; being dignified; and avoidance of conflict and arguments. In blanket words, none of the admittedly desirable traits enumerated a few lines above—desirable as they are in friends, associates, and political idols from an idealistic viewpoint—can legitimately be set down as executive makers, and cannot be taken as indications of potential executive leadership.

All this is a blow, it is true, to fine old shibboleths and traditions that have influenced many a vote in the decent-hearted United States; but do not conditions of the times and the plight of the various governments indicate, unfortunate as it may seem to many, that in our hunt for sorely needed executive ability for public office we should put these traditions and shibboleths, at least for a time, among the moth balls?

Well, so much for the bubbles! What, then, are the traits that marked the strong executives of our survey, as differentiated from the weak; the composite of traits earlier designated as the hall mark of executive leadership; the traits clearly present in the “comers,” and proportionately absent in the group we have, for want of a better term, dubbed the weak executives? (Quite probably, these weak executives are executives by accident of choice, rather

than because of ability, and even as this is written many may be executives no longer.)

Disclosed partly in the man, in his attitudes, attributes and habits, and partly in his record, his appointments, and the results of his actions and decisions, the executive-making qualities, as we found them, were as follows: The good executive has the capacity, mental or physical or what-you-will, of impressing others as having oceans of confidence in himself. He has marked judgment of men, so that those he has selected turn out to be superior in the jobs and posts to which he has assigned them; likewise, his judgment of events is such that he has been able to anticipate future changes and developments. He has an innate and active desire to plan and organize the work of others.

He has a clear and fearless desire to meet other men openly, together with an inspirational quality, persuasive or forceful or both, that brings others to his viewpoint and keeps them working toward a common goal. He shows a continued disposition to seek responsibility, to make decisions and to stand by them in the face of odds. He is usually sure enough of himself and his job to size up situations, to plan courses of action and put them into operation in what to many men would seem the twinkling of an eye, but which in reality gives him a prior claim on leadership in any group. He is a man who has demonstrated a liking and a capacity for doing a good job of direct, person-to-person leadership, rather than one addicted to sitting back and striving to get things done by others through undercover, impersonal, and subtle maneuvers.

He is a man openly ready to accept responsibility for blunders, without a predilection for buck passing. He is remarkably free from prejudice. He is a good mixer and an omnivorous reader. He is a man who wants others to understand his reasons for his acts; and he openly invites suggestions from others, but is equally downright in doing as he likes about them. He is always wanting the facts,

and he gets them. And he is consistent in his attitudes toward events and toward persons. He knows what he wants, and he can make these wants clear to others.

He has the precious quality of being able to criticize without antagonizing his fellows. He delegates responsibility without fear that in so doing he is lessening his own power or importance. He is, all in all, a direct and fearless realist.

If you want to be a successful leader of people in a worth-while endeavor, these 21 traits should be developed or acquired:

1. Accept criticism cheerfully.
2. Read widely about your work.
3. Keep your spirits up when things go badly.
4. Encourage those working under you or with you to give you suggestions, and act upon as many of these as possible.
5. Delegate responsibility and develop it yourself by "first teaching the fellow under you how to fill your job, and then trying to learn how to fill the job ahead of you."
6. Size up others closely so that you are able to know what they can do and what they cannot do.
7. Learn to like to make decisions, and do not avoid making them promptly.
8. Keep free of prejudices by dealing fairly and squarely with others, regardless of their race, religion, or social standing.
9. Express your sincere opinions, without apologizing for them.
10. Praise others for their good work, but do not become a flatterer.
11. Criticize the work of others, but do not antagonize them.
12. Get the habit of concentrating under difficult conditions of light, heat, and noise.
13. Assume the responsibility for your own mistakes, without passing the buck.
14. Examine your own decisions critically for a few minutes, before accepting them as final.
15. Speed up your time of making decisions, but do not go off "half-cocked."
16. Develop your way of speaking until your words sound as if you had confidence in them.
17. Make people feel at ease when you are talking with them.

18. Be consistent in your dealings with others.
19. Have a high sense of justice, but do not become "preachy."
20. Look people squarely in the eye. (View a recent photograph of Mussolini to get the full bearing of this essential.)
21. Be able to enjoy a good joke.

These 21 traits are a check on whether or not an individual's leadership is of age. These traits belonging to greater leadership are, almost without exception, traits that anyone can develop. Leaders can be made.

J. P. Penny discovered this when he saw his chain-store idea developing into national proportions. To prepare himself for leadership, he dropped out for a while and read widely, studied and analyzed himself, and deliberately added leadership to himself.

John Raskob did the same thing when in the early 1900's he was in the steel business in Nova Scotia and consumed book after book to prepare himself for a greater leadership. Hundreds of the most capable leaders of our time have done the same thing.

Leadership can be developed. American history has proven that in the past, and is proving it now even more convincingly. A century ago, leadership was found mainly in politics and in the army. Five years ago, when we thought of leadership, we thought of industrial activities. Now we think of welfare and social leadership. And why not? The men who are molding our present civilization are not kings, or politicians, or professional soldiers. The present architects of our civilization are our constructive social leaders.



The answer to the wish that an executive were worth two thousand dollars more may often be obtained by giving him the two thousand.

"I want all my responsible men to be wealthy men," a top executive commented recently. "If I see a promising minor executive who may develop into a responsible

caliber, I do everything I reasonably can to help him accumulate some of this earth's wherewithall in substantial amounts. If he is no good, he retires as soon as he can afford to. But if he does not retire, I almost invariably find that every penny I have put into him and every financial advantage I have given him is repaid to the firm many times over in his superior service."

There is a sound psychology behind this executive's policy. Leadership and affluence are closely associated. Perhaps many are affluent because they were "born leaders." But many have become leaders through the very real assistance that their growing affluence had upon their own minds and upon the minds of those under them.

One highly socialized president of a small concern threw the negative side into bold relief when he said that he could weed out his executives with an easy conscience when they were more than comfortably fixed. Firing a man who had only enough accumulated to live on for two weeks was so distressing to him that he kept many incompetents on. But he literally loved giving an executive two weeks' pay at unexpected times, and it was the affluent executive who received this treatment and dismissal.

Self-confidence is one of the positive results that affluence has in the mental state of the executive himself. Having continually to apologize for the condition or cheapness of a motorcar undermines this asset of leadership. Being able to use engraved stationery cultivates it.

The case of the salesman whose product demanded that he call upon presidents illustrates the point. He was making a fair living, with enough surplus to go to the theater occasionally and to buy suits without the extra pair of pants. But he was still far removed from affluence. Having to talk almost entirely with very affluent presidents soon weakened his confidence in himself so that he realized something drastic should be done before this became a serious handicap and lessened commissions would force him back into two-pants suits. The formula he finally

adopted, with considerable success, was to pause for just a second, immediately before the president's door, on his way into the sanctum, and to say under his breath as though challenging the man surrounded with the walnut, "Well, now! Who the hell are you?" This was his protective *open sesame* to bolster up his own confidence in himself.

Family cares are lessened for the affluent executive. He does not start the day wrong with a worry about an impending hospital bill. He does not have to spend the time away from the office helping a tired wife with house chores. He can have the mental inspiration of knowing that his children can have every educational opportunity.

Company funds are not so enticingly alluring to the executive who has resources adequate to provide for all his real needs, and for needs which are not real. The manager of a bonding and casualty firm in Manhattan is a shrewd bachelor, with hunches that are remarkably trustworthy. He makes money for his company by turning down business. Of course it is only in bonding and a few other enterprises that turning down business can be made profitable. He studies the company as well as the individual they want bonded; and the company with a policy of low salaries is likely to have to look elsewhere for the casualty underwriting.

After the stock market slid down the greased pole, one partner of a large metal works stopped in his controller's office and said: "You'd be worth much more to the company for a few weeks now, if you had your money in bonds, or in half a dozen savings banks. I know you are well fixed and too wise to be seriously nicked on the market, but I would bet my interest in the company that you've been nicked good and plenty. Your confident leadership has disappeared along with some of the paper profits you had expected to reap."

Followership as well as leadership is furthered by affluence. Disregarding the few individuals who will always

fawn to get the favor of a wealthy person, the fact still remains that subordinates naturally cooperate and follow more readily when they are working under a man who they know is more than comfortable in circumstances. This widespread tendency has the unfortunate result of making many actually poor leaders produce leadership results, due largely to their influence. Every affluent executive should check up on himself to ascertain whether in his case it is leadership or affluence ship.

Affluence is not a guarantor of leadership; it is rather one of the many accessories which further the net value of real leadership qualities. The histories of famous American families with large numbers of sons who are affluent but sterile in leadership give tragic evidence of this.

Leadership may be temporarily aided by an orgy of spending which enables the executive to "keep up with the Joneses" and maintain an affluent appearance. But the monthly reckoning with installment payments in these cases serves to undermine confidence in self. The appearance may stimulate followership, but it does not build the inner frame of mind essential to the leader. The advertising given the firm by the pretentious front of the executive living beyond his means may be significant, but the executive's consciousness that he is actually a social cheater offsets this many times over.

When Montgomery Ward & Company showed up in the red and T. F. Merceles was called in to remedy matters, the best day's work he did for them, he thought, was at a meeting of the employees, where he had the platform lined with high executives who had risen with the company. Upon his request, each one stood up singly and told briefly how long he had been with the company, what his starting salary had been, and what he was now receiving. The existing salary figures made some of the employees in the audience gasp.

"It got them into the idea of working together," he commented later. It not only showed the opportunity

within the company, but it contributed to the affluence of their leadership.

My advice to the top executive who is worried about the leadership of his subordinates is for him to see whether company policy is undermining the affluence of their leadership. And to the individual executive looking toward more responsibility, the advice is to build real affluence as solidly and as rapidly as possible.

Build soundly, as well as rapidly, on the foundation of personal development and wise thrift. Men, not machines, are the bottleneck of national business progress, and there is one man for each reader to study and help more than the others by a thrifty personal development.

INDEX

A

- Abnormal, 84
Abstract intelligence, 59 f.
(*See also* Intelligence)
Accidents, 2, 20
Adams, F. P., 152
Adolescence, 99-101
Adrenals, 335
After-images, 2
Afternoon slump, 262 *ff.*
Agitator, 104
Agricultural revolution, 71 *f.*
Air-conditioning, 310 *ff.*
Allport, F. H., 167
Ambivalence, 131 *f.*
Anderson, J. E., 194
Andrews, Roy Chapman, 106
Anemia, brain, 266
Anger, 222
Appearance, 208-217
Arguing, 130
Army officers, 41 *f.*
Ataxiograph, 255
Athlete, 302 *ff.*
Attention, 338
lag of, 255 *f.*
lapses of, 269 *f.*
Auditorium, 345
Auto driving, 168
(*See also* Taxicab)
“Average” worker, 33

B

- Bailey, Pearce, 49
Ballistic movements, 242 *ff.*
Beggars, 102
Bench height, 286 *f.*
Bending, 283 *f.*
Bernalds, V., 195

- Bernhardt, Sarah, 150
Bias, 180-196
Biceps, 284
Birthrate, 51, 312
Blindness, 299
Blonsky, P. P., 93
Blood, 265 *f.*, 313
Bloom, Sol, 166
Body build, 208-217
Body sway, 255
Bonus, 80
Bossiness, 139 *ff.*, 147-163
Bragging, 180-196
Brain, 209 *f.*
Brain anemia, 266
Breakage of dishes, 1
Breathing, 241
Brossard, 51
Broun, Heywood, 152
Bryan, W. J., 156
“Bumps,” 208-217
Burnham, W. H., 130 *f.*, 134
“Butt-in-sky,” 147-163
Butler, N. M., 147
Burtt, H. E., 168
- C
- Cafeteria, 275
Caffein, 244
Cancer, 215
Candy packers, 2, 278
Cantor, Eddie, 121
Capital, 46
Carbohydrates, 251-276
Carbon paper, 19
Carrying loads, 291
Cassity, J. H., 215
Casual laborers, 45 *f.*
(*See also* Tramp; Relief)
Catatonic dementia praecox, 132

Catherine II, 140
 Cattell, J. M., 6, 11
 Cerebral hyperemia, 272 *ff.*
 (See also Brain anemia)
 Change, 90 *f.*
 Chant, S. N. F., 82
 Character reading, 208-235
 Charles the Bold, 136
 Chronoscope, 268
 Churchill, Winston, 133
 Clerical workers, 58
 Clerk, sales, 112
 Clever Hans, 227 *f.*
 Clothing, 311, 319-327
 Coal mine, 1, 2, 27
 Cockroach, 312
 College, 43
 (See also Education)
 Color-blindness, 43 *f.*
 Compensation cases, 199
 Consulting psychologists, 5 *f.*
 Contrariness, 129-146
 Control of muscles, 292-307
 Cook, Lee, 88
 Coordination of muscles, 32
 Counterbalance, 288 *f.*
 Crime, 55, 165

D

Darwin, 96
 Daydreaming, 101
 Deafness, 328-357
 Debating, 180
 Deception, 197-207
 Decibels, 328-357
 Decline of U. S. intelligence, 47
 Delinquency, 55
 Desk drawers, 290
 Desk rack, 22
 Detectives, 224
 Dieting, 259 *ff.*
 Digestion, 266 *f.*
 and noise, 340
 Dislike of people, 122 *f.*
 Disraeli, 169
 Dissatisfaction (see Satisfaction)
 Divining rod, 229

Divorce, 138, 143
 Dole, 46 *f.*, 94
 (See also Relief)
 Dominant persons, 134
 Draper, George, 214
 Drowsiness, 262 *f.*
 Dynamometer, 258

E

Ear stopples, 353
 Eating, 251-276
 Education, 42 *f.*, 44 *f.*, 57 *f.*
 Edward VI, 135
 Efficiency engineer, 10
 Ego, 186
 Eight-hour day, 247 *f.*
 Electric meters, 301
 Emotions, 222
 Emotional frustration, 87 *f.*
 Emperor Charles V, 167
 Emperor Francis II, 154
 Emperor Joseph II, 154
 Employment managers, 234 *f.*
 Employment psychology, 16 *f.*
 (See also Vocational guidance)

Empress Theodora, 166

Energy, 236-250
 Engineering, human, 8
 industrial, 10
 efficiency, 10
 English, H. B., 167
 Ergograph, 98
 Exaggeration, 180-196
 Exhibitionism, 164-179
 Eyestrain, 1, 2, 18, 270 *f.*

F

Facial expression, 218-235
 Family trouble, 143
 Farms, 35, 48, 71
 Farnsworth, P. R., 167
 Fatigue, 2, 19 *f.*, 96 *f.*, 236-276
 Fear reaction, 336
 Feeble-minded, 30, 41, 43 *f.*
 Felekey, A. M., 222
 Filing, metal, 2

Finger, 282
 fatigue, 98
 Flexibility, 90 f.
 Floaters, 45
 (*See also Dole; Relief*)
 Foods, 251-276
 Ford Motor Co., 70
 French Revolution, 136
 Frustration, 87 f.
 Funerals, 167

G

Gahagan, L., 222
 Gait, shuffling, 295
 Gallipoli, 133
 Gallup, G. H., 112
 General ability (*see Intelligence*)
 General Electric Co., 23
 General Motors Corp., 108
 Georgia Magnet, 277
 Gestures, 225 f.
 Gilbreth, 10, 11, 19, 22
 Glands, thyroid, 99 f.
 Glaze, J. A., 261
 Glycogen, 236-276
 Goodenough, F. L., 132
 Gossip, 140 f.
 Government, 151
 Grant, Genl. U. S., 138
 Green, Wm., 81
 Grinding, 287 f.
 Groves, E. R., 34

H

Haggard, H., 262
 Hammering, 290 f.
 Handles, 286 f.
 Handwriting, 211 f.
 Hankin, Hanbury, 142
 Harding, Warren, 111
 Hartshorne, Hugh, 195
 Harum, David, 129
 Height, of bench, 2, 40, 286 f., 290
 Hemastatics, 271
 Henry IV, 130
 Hepner, H. W., 109, 149

Heredity, 48 f.
 Hill, A. V., 238
 Hinsie, L. E., 89
 Hitler, 157
 Hollingworth, H. L., 182 f.
 Hollingworth, L. S., 134
 Honesty, 180-207
 Hopwood, J. O., 69
 Horses, thinking, 227 f.
 Hours of work, 246 f.
 Hrdlicka, A., 220
 Huckleberry Finn, 141
 Human engineering, 8
 Humidity, 317 f., 308-318
 Humor, 188
 Hunter, W. S., 312
 Hypnotism, 98

I

Imaginary playmates, 194
 Immigration, 47, 52 f.
 Implicit changes, 224
 Incentives, 78-92
 "Increasing Personal Efficiency," 306
 Individual differences, 27-92
 Industrial engineer, 10
 Industrial revolution, 71
 Inferiority, 177 f.
 Inheritance, 48 f.
 Ink, drawing, 21
 Insurance, 28, 36
 Intelligence, 27-92
 mechanical, 17
 social, 108-128
 states, 49 f.
 tests, 40 f.
 Interfering people, 147-163
 Interests, 78-107
 Involuntary movement, 226 f.

J

Jealousy, 143
 Job interests, 106
 Joints, 283
 Jones, E. S., 88
 Judgment, 180-196

Kaiser Wilhelm II, 181
 Kant, 96, 114
 Keeler, Leonard, 199
 Keith, Sir Arthur, 73
 Keller, Helen, 299
 Kempf, E. J., 141
 Keppel, F., 106
 Kerr, Andy, 272
 Kitson, H. D., 106
 Knight, F. B., 185
 Kreuger, Ivar, 198
 Kymograph, 270

Labor, organized, 80
 Labor-saving (*see* Fatigue)
 Lactic acid, 240 *f.*
 Lamp, miners', 2
 Langfeld, H. S., 222
 Laziness, 93-107
 Leadership, 358-371
 Lewis, J. H., 169
 Lewisohn, S. A., 15
 Levy, D. M., 132
 Liebig, 93
 Lie detector, 197-207
 Lifting, 2, 278 *f.*
 Lighting, 18 *f.*, 23
 Lincoln, 64, 144
 Load carrying, 291 *f.*
 Louis XIII, 133
 Lying, 180-207

M

McDougall, W., 144, 194
 Machinery, and human element, 32 *f.*
 McIntyre, O. O., 166
 McPherson, Aimee, 166
 Macrosplanchnic build, 214
 Madsen, I. N., 81
 Maltose, 251-276
 Manic-depressive, 213 *f.*
 Marietta Apparatus Co., 61
 May, Mark, 195

Mechanical intelligence, 17
 Memory, 270 *f.*
 Mental addition, 267
 Mental age, 59 *f.*, 62 *f.*
 Mental wage, 78
 Metabolism, 239
 Meters, electric, 301
 Microsplanchnic build, 216
 Monotony, 20, 78-107
 Morale, 247
 "More Zest for Life," 86, 128
 Morgan, J. J. B., 143
 Morons, 57-77
 Moss, F. A., 109
 Motions, 20-22
 Movements, ballistic, 242 *f.*
 Movies, 221
 Munitions plants, 248
 Murdock, K. M., 195
 Murphy, G., 195
 Muscle, 271-291
 "Muscle bound," 283
 Muscle control, 292-307
 Muscle, of face, 220
 Mussolini, 157
 Myers, C. S., 6, 9, 10, 12
 Myerson, A., 143

N

Nagging, 129-163
 Napoleon, 154, 157
 Narcissism, 164-179
 Nash Motor Co., 31
 National Institute of Industrial Psychology, 6, 9, 21, 25
 National Office Management Association, 361
 Negativism, 129-146
 Nelson, F., 132
 Nobleman, 172
 Noise, 328-357
 Normal distribution, 33

O

Occupations, intelligence requirements of, 65-68

Ouija board, 230
 Overestimation, 180-196
 Overtime, 247
 Oxygen, 236-250

P

Packing, 278
 Partitions, 349
 Pavements, 346
 Pencil rack, 22
 Pepys, Samuel, 143
 Personality, 84 *f.*, 108-128
Personnel Journal, 12
 Phrenology, 208-217
 Physiognomy, 208-217
 Pintner, R., 45 *f.*
 Plaster, 348
 Poker players, 151 *f.*
 Polishing, 288
 Pond, Millicent, 66
 Pope Gregory VII, 130
 Porteus, S. D., 145
 Posture, 246, 274 *f.*
 Posture chairs, 23
 Practice, 304 *f.*
 Prepositioning, 293 *f.*
 Printing plant, 30
 Printing press, 343
 Prodigy, 30
 Prohibition, 156 *f.*
 Psychological Corporation, 6, 7, 24
 "Psychology and Profits," 13
 "Psychology of Selecting Men," 7, 41,
 115, 192
 Purdue University, 116

R

Radical, 131, 138, 147-163
 Ramus, Carl, 141
 Rand, Sally, 165
 Rats, and noise, 339 *f.*
 Reading character, 208-235
 Recklessness, 168
 Reducing diet, 259 *f.*
 Reformers, 147-163
 Relatives, 64 *f.*

Relief, 47 *f.*, 50 *f.*, 74 *f.*, 105
 Restaurant, 1, 236 *f.*, 275
 Rest pauses, 245 *f.*
 Revenge, 143
 Revolution, agricultural, 71 *f.*
 Reynolds, M. M., 132
 Riddle, E. M., 151
 Robinson, E. A., 41
 Roosevelt, Theodore, 109
 Rowntree, B. S., 15, 18
 Rubber stamp, 22
 Russia, 24, 93

S

Sabine, W., 346
 Sadina, S. I., 148
 Sales, 23 *f.*, 25, 28
 Sales clerk, 60, 112
 Salesmen, 115, 230
 Satisfaction, 20-21, 78-92
 Schizophrenia, 215 *f.*
 Schooling (*see* Education)
 Schwab, Charles, 111, 129
 Screw-driver handles, 287
 Seaman Body Corp., 31
 Self-confidence, 368
 Selfridge, H. G., 80 *f.*
 Selling, 47 *f.*
 Senses, 293 *f.*
 Sex differences, 94 *f.*
 (*See also* Women)
 Shifts, 2
 Shoe factory, 28
 Shoveling, 289
 Showing off, 164-179
 Sidis, B., 144
 Silk weaving, 28
 Sleep, 262 *f.*
 Sloan, A. P. Jr., 108, 147
 Slums, 47
 Snob, 171 *f.*
 Social intelligence, 108-128
 Socrates, 155
 Soldering, 297, 299
 Sorokin, P. A., 167
 Sound-absorption, 328-357

- Speed, 241, 244 *f.*
 of movement, 29
 of thinking, 268
- Stair climbing, 253 *ff.*
- Stalin, 157
- Standing, 2
- State, intelligence of, 49 *f.*
- Steel mill, 248
- Stenographers, 115
- Stereotyping, 247 *f.*
- Stoelting Co., 61
- Stomach contractions, 336 *f.*
- Stooping, 20, 246
- Stout, W. B., 91
- Strength, 258, 277-291
- Stretching, 2
- Strong will, 129-146
- Stubbornness, 129-146
- Sugar, 236-276
- Suggestion, 184
- Sunlight, 323 *f.*
- Swelled head, 150
- Syracuse University, 173
- Taxicabs, 2, 28
- Taylor, F. W., 10
- Teagarden, F. M., 63
- Telephone operators, 57
- Telephone stalls, 347
- Teletypewriter, 344
- Temperature, 19, 308-321
- Tendons, 281
- Terman, L. M., 39
- Tests, of intelligence, 40 *ff.*
- "That tired feeling," 251-276
- Thyroid gland, 99 *f.*
- Tinplate mill, 249
- Tom Sawyer, 141
- Tom Thumb factory, 332 *f.*
- Toolmaker, 59
- Traffic, 346
- Training, 31
- Tramps, 96, 101
- Travis, L. E., 167
- Troublemakers, 104
- Tulchin, S. H., 132
- Typewriter, 341
- Typists, 334
- U
- Unemployed, 45 *f.*
 (*See also Relief*)
- V
- Van de Water, M., 168
- Vaughan, W. F., 167
- Ventilators, 347
- Vermont, 49 *f.*
- Vocational guidance, 16 *f.*, 21, 27-77,
 104 *f.*
- Voter, 75 *f.*
- W
- Walker, Jimmy, 166
- Walking, 285
- Wall St., 47
- Warren, H. C., 133
- "Weaker sex," 94 *f.*
- Wealth, 367 *f.*
- Weather, 308-327
- Western Electric Co., 145
- Whalen, Grover, 166
- "What Makes People Buy," 55
- Wheelbarrow, 283 *f.*, 289
- "Why We Don't Like People," 128
- Wiggam, A. E., 58
- Wiggly blocks, 17
- Wilde, Oscar, 169
- Wilson, W., 111, 133
- Women, 94 *f.*, 178, 320, 326, 348
 (*See also Sex*)
- Woodrow, H., 195
- Woodworth, R. S., 106
- Work area, effective, 295, 304 *f.*
- World Book Co., 61
- World War, 38 *f.*
- Wrist, 282
- Writing, 29 *f.*